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Editorials

NOT ONE PRACTICING PHYSICIAN INVITED

THE PRESIDENT AND HIS COMMITTEES CONSIDER THEMSELVES ABLE TO PLAN FOR THE HEALTH AND PROTECTION OF AMERICAN CHILDREN WITHOUT THE INTERFERENCE OF DOCTORS

An interesting exhibition of the laity's delusions of grandeur in point of medical knowledge was displayed when President Hoover's committee was announced for work on the question of the health and protection of children. Only those medical men were included whom it would have been a direct cabinet and political insult to omit. Neither the American Pediatric Society nor the American Medical Association were asked to co-operate. Significant, however, is it that the list includes the editor of a "woman's magazine" that made one of its greatest circulation drives by a campaign for "better babies," and the President of the American Federation of Labor, as well as a mining engineer and a member of the committee for improving the condition of the poor.

The President's committee for the determination of the facts "as to the present progress and future need for the health and protection of children" met on July 29 at Washington, D. C. The President announced that "a series of committees will be appointed from the *leaders in national organizations.*" Medical organizations evidently do not count with Mr. Hoover.

Just what may be expected doctors will not have a hard time in guessing.

As stated in the October number of the *Bulletin* of the St. Clair County Medical Society:

"By the President's committee the subjects to be studied embrace regular medical examinations, school or public clinic for children, hospitalization, adequate milk supplies, community

nurses, maternity instruction and nurses, teaching of health in the schools, facilities for playgrounds and recreation, dependent children, child labor and scores of allied subjects. A sum of $500,000.00 from private sources has been placed at the disposal of the President to cover the expenses of the preliminary committees, the conference and the follow-up work which will be required to carry out its conclusions. The work of the conference will be under the direction of the secretary of the interior, Dr. Ray Lyman Wilbur, with the cooperation of the secretary of labor, James J. Davis. The members of the committee comprise a chemist, a commissioner of food and drug inspection, a mining engineer, an executive secretary, the director of the Children's Bureau at Washington, a member of the National Amateur Athletic Association, a member of the Association for improving the condition of the poor, a judge, a superintendent of schools, the Director of the American Child Health Association, the surgeon general of the Metropolitan Life Insurance Company, the president of the American Federation of Labor, the editor of the *Woman's Home Companion*, a staff member of the *Herald Tribune* of New York, a member of the department of child welfare of World's W. C. T. U., a social economist, a member of the National Health Council of New York, a member of the Bureau of Home Economics of the Department of Agriculture, a former congressman from Virginia, a past president of the American Pediatric Society, a state health commissioner and two private citizens not listed as affiliated with prominent national organizations. In all the committee comprises sixteen men and eight women.

"It is surprising that President Hoover has not shown more recognition of any organized medical group in his choices."

THE PRECEPTOR SYSTEM FOR MEDICAL STUDENTS—MASS EDUCATION IN MEDICINE INVOLVES A CONTRADICTION IN TERMS

Advantages of a preceptor for the student doctor are of value incalculable. After all, visual education must complement theoretical expositions. California, Wisconsin, Michigan and Harvard University are trying to blaze the way in experimenting with the preceptor system for medical undergraduates.

Such an applied and direct science as medicine dare not train its men by books alone and hope for a maximum result of efficiency. Skill of eye, hand, mind, and intuition are essential complements of character and integrity.

Experienced practitioners regard with pleased interest that verges almost upon enthusiasm those various experiments throughout the country, of what promises to be a resumption of the preceptor system.

At intervals since 1923 there has been a decided tendency towards reviving the preceptorial or apprentice system of medical students. Prior to the time when colleges and universities of medicine and of the healing arts had attained their present high standard it was the custom for a youth with his mind on medicine bent to be practically apprenticed or "bound out" to general practitioners who taught these tyros the "Art as well as the science of medicine," or more scientifically phrased, the psychology of dealing with people as well as skill with physics and physiques.

Such training, of course, should not supplant clinic and classroom medical instruction but beyond a doubt it is a necessary and vital supplemental unit. Know what is in a man's mind and you are well set to know how to treat his body.

Practical experiments along this line are now in process of evolution and application at the Schools of Medicine of the Universities of California, Wisconsin and Michigan and Harvard University. Much is expected from this rejuvenation of the field training system and its correlation with the accepted curriculum of medical schools of high standards. By its use expectation is felt that medical students will gain in training a fuller realization of the responsibilities of a physician who will succeed in practice. Often there is far more medical education to be gained from one patient handled with a full sense of responsibility than in a dozen patients in which the responsibility is shared with another. There are few inspirations as great for a medical student as for him to come into direct and actual contact with the ordinary life of a practicing physician. In this contact is con-

tained that thrill of anticipatory experience that is the light that lessens the load of the drudgery of training. Coupled with modern efficiency in medical schools and universities, even higher standards of medical practice may be expected from this revival of a method of instruction from which was produced that wonderful type of "family physician" so highly qualified, so greatly admired and at present so nearly extinct.

One of the greatest advantages accruing from this apprentice system lies in the practical psychology harvested. In this practical psychology lies the secret of the success of the quack and charlatan. At the outset the quack learns how to handle people. Technique instead of technical knowledge is the *sine qua non* among the assets of the charlatan. While some medical students are born psychologists and know how to approach persons instinctively, still others who acquire the science of medicine with a thoroughness akin almost to genius, seem never to learn how to make a happy approach to a patient. The reason for this is that this angle of medical practice has never been taught with precision and actual definitude. It is practically out-school laboratory work that has been overlooked when the curriculum has been made up. The "art" of medicine has been neglected usually when the medical school sends forth its tyro. He is armed with his diploma, his knowledge and his license to practice medicine but he does not know how to handle the sick and ailing so that these hapless ones will realize that the physician's ministrations are needed. It is much the same as having explained to a man all about how an automobile is made, and how to handle the car's brakes and levers without ever actually letting him sit in a car to drive a machine. Such a man who started out to be a chauffeur would have a pretty hard time before he became a really efficient driver, even if he were the finest mechanic in the world.

Dr. W. J. Kerr, head of the medical school of the University of California, decided to make a practical demonstration of the method of preceptorship. Four senior students were selected. Three were assigned to general practitioners. The fourth was sent to a small country hospital. Subsequent reports of these students were rich in result. One student spent a month in the office of a physician keenly interested in civic affairs. The awakening of the student to what some of the practicalities of such work means is outlined in these excerpts from his report:

One can see that a general practitioner is a busy man. Not only were professional duties attended to, but also municipal duties along public health lines. There were also the noon luncheon clubs to attend and committee meetings of all kinds.

Dr. Chain, being health officer of the city of Eureka, made calls on smallpox, and other patients with "reportable" diseases. I also saw the inner workings of a city health laboratory. Every day the city water was tested for colon bacillus, and once a month the milk supply was given a bacteria count. The routine diphtheria cultures were run through every day, and many other examinations of specimens of all kinds made.

I also saw the indifference of the average doctor to public health matters. Some even resent interference with their work, even in the enforcement of quarantine.

The Tuberculosis School was another source of interest and profit to me. In this school they teach the persons who are infected how to live and how to prevent the spread of the disease, as well as help them on the road to recovery. Contacts are taken in and taught the food to eat, the precautions to take, and the routine life they must live in order that the disease will not take a firm root in their bodies.

To do effective public health work in the small town is not conducive to popularity. The quarantine of a diseased case may gain the enmity of the doctor and the family. The killing of a pet poodle with rabies may incur the enmity of a certain faction in the community. The destruction of a herd of tuberculous cattle brings a decided reaction from the farmers. The life of the public health doctor is a bitter struggle, where enemies are made and very little praise received. One must have the courage of his convictions and have the good of his profession and the welfare of the community at heart.

These small-town doctors possess that wonderful something that one acquires in mastering the art of medicine. They do not have patients who are seen in the ward or office and then forgotten. All of their patients are their friends. The doctor is vitally interested in them and they have absolute confidence in him. It is an inspiration to see the faith that these people have. They are a simple people, and demand simplicity in return. All the doctors possess that spark of sympathy that kindles in every person a feeling of faith and hope. One realizes that ours is a noble profession and demands high ideals. You are the priest as well as the doctor, and in many of the cases a bit of kind advice goes much further than tons of C. C. pills.

The picture must not be painted too brilliantly. Unfortunately, one must live. One must have money. There are men in the profession who so devotedly

worship at this shrine that they lose their higher ideals. This is often the cause of bitter jealousies and of unprofessional practices. The cream of the jest is that this is merely Life. In the lecture hall and classroom we do not realize that outside of the college there is a bitter fight for the preservation of life and the very detail of living.

"The preceptor system in medicine is based upon the idea that medicine is an art as well as a science," states the *Bulletin* of the Association of American Medical Colleges. "The physician must not only know, he must *know how*, and knowing how involves a knowledge of the conditions in which the physician must practice."

A recent issue of the *New England Journal of Medicine* says:

The first aim of the medical school is to train practitioners of medicine, and general practice is the field calling for the largest number of workmen. It is also the field that is changing most rapidly and one in which success calls for the greatest versatility. Working with a successful physician day after day in his practice is an invaluable experience for the young doctor.

What may be regarded as the newer system of medical education makes no provision for supplying this introduction. But there is a need and efforts to meet the need are apparent in the development of "extra-mural" instruction, in various schools.

The "extra-mural" quality lies in the fact that the teacher is a man in general practice, generally remote from the medical school. Such a teacher is commonly spoken of as a preceptor and this introduces an idea somewhat foreign to medical education and important in its consequences. It is the idea of individual instruction, of which a beginning has been made at the Harvard Medical School, though there it is "intramural." This training emphasizes the fact that the student learns certain things best from a teacher, true of every art, and recognizes the proper relative value of informal and formal teaching. Mass education in medicine involves a contradiction in terms.

Just how this change is to be made in the system of medical education will be determined by the circumstances in which each school is placed. In California a few students in their fourth year are sent out to selected alumni of the School. In Wisconsin, advantage is taken of the clinical centers developed in "group practice," so rapidly growing in certain parts of the country.

The *Boston Medical and Surgical Journal* says in part:

"At Wisconsin University, from one to three students at a time were apprenticed experimentally to a clinic situated in one of the smaller cities of the State. Now, it is planned to have each student spend six months in extra-mural study, that time being divided between two clinics. At the University of California this system has been under trial for three years. The first year four students were selected; the second and third years, eight; this year, ten will be so placed. The plan followed at California differs somewhat from that followed at Wisconsin. At the former school, the students are placed for one or two months with a carefully selected preceptor who is a general practitioner in a community of from 3000 to 5000 inhabitants.

"At Michigan, two months of the summer vacation were utilized for this purpose, the experiment being made only by students who volunteered to spend a part of their vacation in this way. Dean Cabot said that letters from all the physicians who had had students were uniformly satisfactory. The students, on their part, showed evidence of being both stimulated and benefited. One student, a man somewhat below the middle of his class in scholastic standing, wrote his preceptor as follows: 'Just a line to express my appreciation of the best two months I have ever experienced in the field of medicine from the student point of view; in fact, my respect for the practice of medicine has increased 500 per cent. since last June, all of which is due to my association with you.'

"Is this innovation in medical education going to prove of value, or is it an ephemeral attempt to correct a faulty tendency in medical instruction We can hardly visualize such an experiment in our Eastern schools. The greater number of charitable hospitals in the East, with their huge out-patient departments, offer unlimited material for the teaching of practical medicine. We doubt if the faculty of an Eastern school would take the pains to hunt up suitable preceptors in the smaller towns and groom them for their jobs. We doubt if the busy general practitioner of Middleboro or North Adams would have the time or the inclination to coöperate with the faculty of Harvard, Tufts or Yale for the sake of showing a medical undergraduate the intricacies of his daily routine.

"Advantages of such a plan are obvious, provided the preceptor is well trained and conscientious. As Dean Bardeen of Wisconsin says, even the occasional preceptor who illustrates how *not* to practice medicine teaches a lesson. The association of the man in practice with a student fresh from the lecture room and the laboratory should prove to be a stimulation and a pleasure to both."

This New England comment is far less antagonistic than on the face of things it appears to be. The states of the Pilgrim Fathers are always fine adherents of the poetical admonition,

"Be not the first by whom the new is tried;
Nor yet the last to lay the old aside."

In this instance, however, the preceptor system is merely a reversion to a system of medical education that was young when the science itself was in its youth. Not everything old is in error or to be despised as the civilized world daily re-discovers.

MAKE CHICAGO THE MEDICAL CENTER OF THE WORLD

Recent comment in one of Chicago's largest daily newspapers ran to the effect that from 10,000 to 15,000 Chicago patients go annually from this city to a much advertised and highly exploited clinic in a nearby state. Undoubtedly an equal number of persons seek a similar clinic in another nearby state.

This of course is both needless, nonsensical and inexcusable. That Chicago doctors, both competent in themselves and with thoroughly efficient co-operative facilities should lose this great number of patients is culpable. Nowhere is the ability of Chicago's several thousand medical practitioners, surgeons and specialists surpassed, and it is doubtful if many are even equalled. Chicago stands at present the medical center of the world.

THE 1930 ANNUAL MEETING OF THE ILLINOIS STATE MEDICAL SOCIETY

The 1930 Annual meeting of the Illinois State Medical Society will be held in Joliet on May 20, 21, and 22, 1930. The Will-Grundy Medical Society, the host society, has started the arrangements for a highly successful meeting. Dr. B. G. Wilcox, Joliet, has been selected as General Chairman of the Arrangement Committee and has grouped into his committee, the following:

COMMITTEE ON ARRANGEMENTS

General Chairman, B. G. Wilcox.

Chairman, Reception Committee, E. A. Kingston.

Chairman, Committee on Meeting Places, R. Ahlvin.

Chairman, Registration Committee, V. Cohenour.

Chairman, Finance Committee, G. Houston.

Chairman, Contact Committee, Edward Talbot.

Chairman, Committee on Information and Hotels, R. B. Leach.

Chairman, Committee on President's Dinner, W. Hedges.

Chairman, Transportation Committee, Walter Huey.

Chairman, Entertainment Committee, B. Klein.

Chairman, Committee on Exhibits, Raymond Brown.

Chairman, Woman's Auxiliary Committee, Marion M. Bowles.

Secretary and Treasurer of Committee, Paul E. Landmann.

It is the desire of the Committee on Arrangements to cooperate with the Illinois State Medical Society, its officers, the Council, and officers of Scientific Sections as thoroughly as possible in making the 1930 annual meeting one to be long remembered.

More definite plans concerning the 1930 Annual Meeting will be given out at an early date.

MEMBERS OF STATE SOCIETY WHO DESIRE TO READ PAPERS AT ANNUAL MEETING OF THE STATE SOCIETY

All members of the Illinois State Medical Society in good standing, who desire to present papers at the 1930 Annual Meeting of the Society in Joliet, May 20, 21, 22, 1930, should get in touch with the officers of the Section in which they are interested as early as possible. The subject of the paper, nature of same, or a synopsis should be submitted with the request. The number of papers to be presented in each section is limited, and the Section Officers are anxious to have their programs completed as early as possible. It is the usual custom to divide the number of papers in each section, between members in the Chicago Medical Society, and members of Down-state Societies.

The following are officers of the several sections:

SECTION ON MEDICINE

Dr. Frank Deneen, Chairman, Bloomington.

Dr. L. D. Snorf, Secretary, 25 East Washington Street, Chicago.

SECTION ON SURGERY

Dr. F. L. Brown, Chairman, 4034 West Madison Street, Chicago.

Dr. J. H. Bacon, Secretary, Peoria.

SECTION ON EYE, EAR, NOSE AND THROAT

Dr. Walter Stevenson, Chairman, Quincy.

Dr. Harry S. Gradle, Secretary, 58 East Washington St., Chicago.

SECTION ON PUBLIC HEALTH AND HYGIENE

Dr. John J. McShane, Chairman, Springfield.

Dr. Chas. H. Miller, Secretary, 826 East 61st Street, Chicago.

SECTION ON RADIOLOGY

Dr. I. S. Trostler, Chairman, 25 East Washington St., Chicago.

Dr. Henry W. Grote, Secretary, Bloomington.

SECRETARIES' CONFERENCE

Dr. W. H. Smith, President, Benton.

Dr. I. L. Foulon, Vice-President, East St. Louis.

Dr. W. D. Murfin, Secretary, Decatur.

It is the desire of each Section, to have the best program for 1930, that it is possible to get, and the papers must be carefully selected, which makes it necessary to submit as much information relative to the nature of same, as possible, so the programs can cover as wide a range as possible in each section.

DOCTORS DESIRING TO PRESENT PAPERS BEFORE THE 1930 MEETING OF THE ILLINOIS STATE MEDICAL SOCIETY

TAKE NOTICE.

Members of the Illinois State Medical Society wishing to present papers before the Surgical Section at the next meeting in Joliet, Illinois, May 20, 21 and 22, 1930, kindly communicate with the undersigned.

The title and synopsis of the subject must be in the hands of the Secretary not later than January 15, 1930.

FRANK L. BROWN, M. D.,
Chairman, Section on Surgery,
4034 Madison St., Chicago, Ill.
JAY H. BACON, M. D.,
Peoria Life Insurance Bldg.,
Peoria, Ill.

ANNUAL CONVENTION OF THE TRI-STATE MEDICAL ASSOCIATION OF MISSISSIPPI, ARKANSAS AND TENNESSEE

Illinois doctors are invited to attend the forty-sixth annual convention of the Tri-State Medical Association of Mississippi, Arkansas and Tennessee at Hotel Peabody, Memphis, Tennessee, January 14-16, 1930.

For detail program see advertisement in the advertising pages of this issue.

WANTED: BACK NUMBERS OF THE ILLINOIS MEDICAL JOURNAL

The Bureau of Science Library, Department of Agriculture and Natural Resources, Manila, Philippine Islands, desire back numbers of the JOURNAL as follows:

Vol. 29—February and March issues, 1916.

Vol. 30—August and December issues, 1916.

Kindly send numbers asked for to the ILLINOIS MEDICAL JOURNAL, 185 N. Wabash Ave., Chicago.

The managing editor would like a copy of Vol. 26, July, 1914. Please state price.

FIFTH INTERNATIONAL CONGRESS OF PHYSIOTHERAPY, LIEGE, SEPT. 4-8, 1930

The organization of this Congress is progressing rapidly and we would draw the attention of physicians to the real union which will take place in Liege on the occasion of the International Exposition and the Centenary of Independence.

Physicians who wish to be enrolled may send in their titles and subscriptions for membership in the Congress.

Acceptances may be sent from now on to Dr. Dubois-Trepagne, Secretary-General, 25 Louvrex Street, Liege, Belgium, with the dues of 150 Belgium francs. This will facilitate the organization of a Congress which will be noteworthy among the sessions of 1930.

AMERICAN MEDICAL ASSOCIATION

ABSTRACT OF THE PROCEEDINGS OF THE HOUSE OF DELEGATES AT THE PORTLAND SESSION OF THE AMERICAN MEDICAL ASSOCIATION JULY 8 TO 12, 1929

The eightieth annual session of the American Medical Association was held in Portland, Oregon, July 8 to 12, 1929.

The minutes of the seventy-ninth annual session were approved as printed. The annual addresses of the speaker, the president, and the president-elect were heard by the House and referred to the Reference Committee on Reports of Officers. These addresses appeared in *The Journal of the American Medical Association* for July 20, 1929. . . .

That part of the report of the Board of Trustees dealing with the need for a new building to house the activities of the Association was referred to a special committee appointed by the speaker on authorization of the House.

History of the American Medical Association.—Dr. William Allen Pusey, delegates from Illinois, submitted

a resolution providing for the appointment of a committee by the Board of Trustees to direct the preparation and publication of a comprehensive history of the Association. This resolution, having been referred to the Board of Trustees, was recommended for adoption and the recommendation was approved by the House of Delegates.

Practice by Corporations and Other Groups and the Relationship of Physicians Thereto.—Dr. William Allen Pusey, delegate from Illinois, presented a resolution providing that the Judicial Council of the Association be asked to present to the House of Delegates at the annual meeting in 1930 a comprehensive statement for the guidance of the American Medical Association concerning the practice of medicine by corporations, by clinics, by philanthropic organizations, by industrial organizations, by demonstrations and by similar organizations, and concerning the relationship of physicians thereto.

This resolution was considered by the House of Delegates in executive session. The resolution was adopted.

Home for Indigent Physicians.—Dr. J. Norman Henry of Pennsylvania submitted the report of a special committee appointed to study the need for the establishment of a home for needy physicians. This report was referred to the Board of Trustees and was recommended for adoption. After discussion by several delegates, the recommendations of the Board of Trustees were approved, and the report of the committee adopted. The report of the committee advised against the establishment by the Association of a home or homes for indigent physicians, and expressed the opinion that "it is not, nor should it be, a function of the American Medical Association *at this time* to undertake the care of indigent physicians in any way."

Lists of Physicians in Classified Telephone Directors.—Dr. G. Henry Mundt, delegate from Illinois, submitted a resolution providing that when publishers of classified telephone directories impose a charge for listing the names of ethical physicians in such directories, component county medical societies of the American Medical Association be advised to discontinue such listings in classified directories. The Reference Committee on Legislation and Public Relations, to which this resolution was referred, recommended the adoption of the resolution and the recommendation of this Reference Committee was approved by the House of Delegates.

Dangers of Illuminating Gases and Gases Used in Electrical Refrigeration.—Dr. J. W. Van Derslice, delegate from Illinois, submitted a resolution providing for the appointment by the Board of Trustees of a committee to study and report on the menaces to health and to life from carbon monoxid gas as a constituent of illuminating gas and as a by-product of the combustion of gasoline in automobiles; on the dangers of gases used in electrical refrigeration, and on steps necessary to be taken for the protection of the public. This resolution, referred to the Reference Committee on Hygiene and Public Health, was adopted by the House.

Advertising Hospitals.—Dr. Burt R. Shurly, delegate from the Section on Laryngology, Otology, and Rhinology, presented a resolution providing that inasmuch as some hospitals, municipal and otherwise, have advertised in the daily press "and have given to the public stories of their special excellence and efficiency as compared with other hospitals," such advertisements be collected by the Council on Medical Education and Hospitals and that the "question of hospital advertising be given due consideration and reported to the House of Delegates at the next annual meeting and the rating of hospitals be affected according to the unethical advertising published."

Needs of Small Hospitals.—Dr. T. O. Freeman, delegate from Illinois, submitted resolutions providing that the Council on Medical Education and Hospitals be ready to make a survey of the needs of smaller hospitals, to render all possible assistance to such institutions desirous of improving their system of records and their services to the public, and to offer its assistance to state registration departments to the end that such departments may secure such aid as they desire in connection with their classification of accredited hospitals. The Reference Committee on Medical Education, to which this resolution was referred, reported to the House of Delegates that, in its opinion, the investigation begun several years ago are now being carried on by the Council on Medical Education and Hospitals, would fulfill all the objects of the resolution, and that the Reference Committee believed that the Council stands ready to give all possible assistance to small hospitals in solving their problems. The Reference Committee recommended that the resolution be not adopted, and this recommendation was approved by the House of Delegates.

Direction of Red Cross Nurses by Cultists.—Dr. J. C. Litzenberg, delegate from Minnesota, submitted a resolution adopted by the Minnesota State Medical Association, disapproving the policy of the American Red Cross in officially authorizing Red Cross nurses to nurse patients under the care of cultists. The Reference Committee on Legislation and Public Relations recommended that the American Medical Association disapprove any change in policy by the American Red Cross, whereby the nurses of that organization would be available for services to patients under the care of cultists, and that the secretary of the Association communicate with the proper officials of the American Red Cross and advise that organization of the attitude of the House of Delegates. The recommendations of the Reference Committee were adopted.

New Building.—The special committee, to which that part of the record of the Board of Trustees dealing with the need for a new building for housing the activities of the Association was referred, expressed its conviction that it is desirable for the Association to have a building "that would be visible evidence of the dignity, importance, and power of the Association," and recommended that it should be left to the Board of Trustees to perfect plans for providing the building.

This committee also expressed the opinion that the subscription price of The Journal is now relatively greatly below the price of other journals that approxi-

mate it in extent and quality, and suggested that the Board of Trustees should consider the question of increasing the subscription of The Journal.

A third recommendation of the committee was to the effect that it would be appropriate for the Board of Trustees, in a building program, to solicit memorial contributions, both large and small, from members of the Association. The committee expressed its conviction that as the Association shows increased evidence of strength and permanence it will gradually become the recipient of an increasing number of memorial contributions.

The report of the special committee was adopted by the House of Delegates.

Later in the proceedings, Dr. William Allen Pusey, delegate from Illinois, introduced a proposed amendment to the by-laws, providing that the subscription price of The Journal shall not exceed $8. This proposed amendment was adopted by the House, and the Board of Trustees is thereby authorized to increase the subscription price of The Journal to a sum not in excess of $8 a year.

Periods of Practical Experience for Medical Students.—Dr. E. J. Goodwin, delegate from Missouri, presented a resolution that had been adopted by the Missouri State Medical Association providing that medical schools be encouraged to arrange for periods of practical experience for students with practitioners of high standing, preferably in rural communities, and that the Council on Medical Education and Hospitals be instructed to consider the plan proposed by the Missouri State Medical Association and, if the plan is found to be feasible and beneficial, the Council be urged to encourage medical schools to "inaugurate suitable methods for providing these vacation periods of practical experience for their students." The Reference Committee on Medical Education reported favorably on this resolution, and it was adopted by the House of Delegates.

Committee on Military Affairs and National Defense.—Dr. H. C. Mallory, delegate from the United States Army, presented a resolution providing for the appointment by the Board of Trustees of a special permanent committee to be known as the Committee on Military Affairs and National Defense, to which shall be referred matters pertaining to national defense and military preparedness. The adoption of this resolution was recommended by the Board of Trustees, and this recommendation was approved by the House of Delegates.

National Defense Act of 1920.—Dr. Holman Taylor, delegate from Texas, introduced a resolution providing that the American Medical Association, through its House of Delegates, go on record as heartily approving the National Defense Act of 1920. The Reference Committee on Legislation and Public Relations reported the resolution favorably, and it was adopted.

Increased Tariff on Surgical Instruments.—Dr. Albert Soiland, delegate from California, submitted a resolution providing that the House of Delegates record its opposition to the passage of a bill providing for increased tariff on surgical instruments, X-ray equipment, vacuum tubes, valve tubes, and scientific glassware. The Board of Trustees recommended the adoption of the resolution, and the House of Delegates approved this recommendation.

Standards of Physical Fitness of Automotive Operators—Dr. H. C. Macatee, delegate from the District of Columbia, presented a resolution setting out that relatively few accidents occur because of defects of sight and hearing and providing that the House of Delegates "consider the advisability of amending the present standards of physical fitness of automotive operators, adopted by this Association, by the adoption of standards of mental and moral fitness to be recommended for adoption by the several states as a condition for issuing licenses to operate motor vehicles, and that this resolution be referred to a special committee for consideration and report at the next annual session." The Reference Committee on Hygiene and Public Health recommended the adoption of the resolution. On motion of Dr. G. Henry Mundt, delegate from Illinois, the resolution was amended by deleting a statement in the preamble to the effect that relatively few accidents occur because of defects of sight and hearing. The resolution as amended was adopted.

Medical Expert Opinion.—Dr. Tom B. Throckmorton, delegate from the Section on Nervous and Mental Diseases, submitted the following resolutions, which had been approved by that section.

Whereas, The House of Delegates of the American Medical Association has previously expressed its dissatisfaction with the present status of medical expert opinion evidence and has expressed its approval of the efforts of the American Bar Association and of the various bar and medical societies to correct by remedial legislation and by changes in court procedure the present undesirable features of the introduction of such evidence; and

Whereas, The American Psychiatric Association and the National Crime Commission are devoting much study to the subject of such evidence, particularly as relates to psychiatric matters in criminal cases, with a view to improving procedure; and

Whereas, The Criminal Law Section of the American Bar Association has appointed a committee to collaborate with a committee of the American Psychiatric Association in formulating plans for bringing about a betterment of the present undesirable situation; and

Whereas, Such efforts are of vital interest and importance to the entire medical profession, be it therefore

Resolved, That the House of Delegates of the American Medical Association express its continued interest in the correction of the abuse of medical expert opinion evidence, and that it offer to the American Bar Association, the American Psychiatric Association, and the National Crime Commission, the various state and county medical and bar associations, and such other reputable organizations as are actively pursuing efforts directed toward such correction the assistance and coöperation of the American Medical Association in promoting the passage of appropriate legislation and in bringing about

suitable changes in court procedure with reference to such evidence; and be it further

Resolved, That the House of Delegates approves the principle of securing in the case of all capital charges and in the case of as many other criminal charges as the psychiatric facilities of the state will permit an impartial and routine mental examination of the defendant in advance of the trial as a means of obviating the contentious introduction of partisan testimony, and that it approves further the principle of removing as far as possible the question of sanity from the trial itself, reserving the employment of psychiatric data for a post-trial inquiry to determine what treatment is appropriate to the convicted person; and be it further

Resolved, That a copy of this resolution be forwarded to the American Bar Association, the American Psychiatric Association, and the National Crime Commission.

On motion of Doctor Throckmorton, seconded by Dr. A. T. McCormack, delegate from Kentucky, and after discussion by various members of the House, these resolutions were adopted by the House of Delegates.

Resolution from Section on Dermatology and Syphilology.—Dr. F. W. Cregor, delegate from the Section on Dermatology and Syphilology, submitted resolutions providing that treatment for hypertrichosis by the tricho system and by allied systems employing radiation be condemned as highly dangerous to the patient, and "that all cases presenting the effects of this type of treatment and seen by members of the medical profession be reported to the Bureau of Investigation of the American Medical Association." The resolutions were adopted.

Amendment to the Principles of Medical Ethics.—The Judicial Council in its report to the House of Delegates, recommended that Section 3, Article VI, Chapter II, of the Principles of Medical Ethics be amended by substituting the following:

COMMISSIONS

Section 3. When a patient is referred by one physician to another for consultation or for treatment, whether the physician in charge accompanies the patient or not, it is unethical to give or to receive a commission by whatever term it may be called or under any guise or pretext whatsoever.

This recommendation of the Judicial Council was adopted by the House of Delegates, and the Principles of Medical Ethics were so amended.

Message from President of Woman's Auxiliary.—Dr. J. H. J. Upham, member of the Board of Trustees, presented a report from the Woman's Auxiliary to the House of Delegates submitted by its president, Mrs. Allen H. Bunce of Atlanta, Georgia, and this message was accepted by the House and made a part of its records.

Election of Officers.—The following new officers were elected:

President-elect, William Gerry Morgan, Washington, D. C.

Vice-president, Ernst A. Sommer, Portland, Oregon.

Vice-speaker of the House of Delegates, Albert E. Bulson, Fort Wayne, Indiana.

Member of the Board of Trustees, Allen H. Bunce, Atlanta, Georgia, to succeed E. H. Cary, Dallas, Texas.

Place of 1930 Annual Session.—Detroit, Michigan, was selected as the place for holding the next annual session of the American Medical Association in 1930.

Correspondence

LAY NEWSPAPER INTERESTED IN OUR STAND ON NEWSPAPER ADVERTISING

THE LONG BEACH SUN

November 25, 1929.

Dr. Charles B. Reed, Pres.,
The Chicago Medical Society,
Chicago, Illinois.

Dear Dr. Reed:

We are very much interested in your stand on newspaper advertising for members of the Medical Society. This matter has been discussed here in Long Beach.

We would very much appreciate copies of THE ILLINOIS MEDICAL JOURNAL for October and any other addresses or decisions you have made on this subject with the view to your serving as a guide in our local field.

With kindest regards, I am

Very truly yours,

ROBERT HENDERSON.

Book Reviews

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 13, No. 2. (Chicago Number, September, 1929.) Octavo of 232 pages with 61 illustrations. Per Clinic year, July, 1929, to May, 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company.

The contributors to this number are Drs. Elliott, Pollock, Grulee, Williamson, Hamburger, Keeton, O. H. Robertson, Walter Lincoln Palmer, Gerstley, Sloan, Finnerud, Meyer.

DISEASES OF THE CHEST AND THE PRINCIPLES OF PHYSICAL DIAGNOSIS. By George W. Norris, M. D., Professor of Clinical Medicine in the University of Pennsylvania, and Henry R. M. Landis, M. D., Professor of Clinical Medicine, University of Pennsylvania; Director of the Clinical and Sociological Departments of the Henry Phipps Institute of the University of Pennsylvania, with a chapter on the Trans-

mission of Sounds Through the Chest, by Charles M. Montgomery, M. D., and a charter on the Electrocardiograph in Heart Disease, by Edward Krumbhaar, Ph.D., M. D. Fourth Edition, revised. 954 pages with 478 illustrations. Philadelphia and London: W. B. Saunders Company, 1929. Cloth $10.00 net.

In this work new material has been added and many sections have been revised, little has been omitted that is of practical value, the book primarily is meant for the clinician.

INTERNATIONAL CLINICS. Edited by Henry W. Cattell, M. D., and others. Volume III. Thirty-ninth series, 1929. Philadelphia & London. J. P. Lippincott.

TULAREMIA HISTORY PATHOLOGY DIAGNOSIS AND TREATMENT. By Walter M. Simpson, M. D. With 53 text illustrations and 2 color plates. New York. Paul B. Hoeber, Inc. 1929. Price $5.00 net.

INTERNS HAND BOOK. By M. S. Dooley, M. D. Philadelphia and London. J. B. Lippincott Company. 1929.

This work is intended as a guide to rational drug therapy, clinical procedure and diets by members of the faculty of the College of Medicine, Syracuse University.

MEDICAL LEADERS FROM HIPPOCRATES TO OSLER. By Samuel W. Lampert, M. D., and George W. Goodwin, M. D. Illustrated. Indianapolis. The Bobbs Merrill Company. Price, $5.00.

The authors, both eminent in their profession, are in active private practice in New York City. In this history the authors attempt to follow the sequence of events from the remarkable medicine produced by Greek culture down to the active and progressive medical science of the civilization of the twentieth century. The evolution from the explanation of illness by the presence of demons, by witchcraft and by supernatural causes to the modern conception of the causation of infections and communicable diseases by living germs.

In the chapter on Mesmer and Cagliostro there is an amusing account of quacks and charlatans from the seventeenth to the twentieth century.

DISEASES OF THE BLOOD. By Paul W. Clough, M. D. New York & London. Harper & Brothers. 1929. Price $2.50.

In this work the author discusses the various types of blood cells and their origins, likewise he discusses the anemias, the leukemias and their related conditions. There is an excellent chapter on blood transfusion, also a section on methods of examination that contains all that is necessary for the practitioner to know.

THE PATHOLOGY OF THE EYE. By Jonas S. Friedenwald, M. D. Illustrated with 253 figures. Mainly Microphotographs. By Helenor Campbell. New York. The Macmillan Company. 1929. Price $4.50.

This work is based on a course of lectures prepared for the instructions of medical students and surgical house officers in the department of ophthalmology of Johns Hopkins Medical School and Hospital.

THE NUTRITION OF HEALTHY AND SICK INFANTS AND CHILDREN FOR PHYSICIANS AND STUDENTS. Second revised edition with 78 illustrations (including charts) and 6 tables authorized translation by Benjamin M. Gasul, F. D. Philadelphia. F. A. Davis Company. 1929. Price $3.50 net.

This work represents the practical application of Professor Pirquet's nemsystem. There is no text book in the English language that deals with the clinical features of this system, it was for this reason that the work was translated into English so that it would be available to the English speaking physician.

CLINICAL MEDICINE FOR NURSES. By Paul H. Ringer, M. D. Illustrated. Third revised edition. Philadelphia. F. A. Davis Company. 1929. Price $3.00 net.

The characteristic features of this work are clearness of expression; convenience of arrangement, conciseness of statement sufficiency of detail, up-to-date text matter, thoroughly practical and exceptionally well indexed for ready reference.

NEW LAWS FOR DRIVERS OF HUMAN MOTORS

Pull your machine up alongside a filling station regularly three times a day and put into it high-test fuel, such as leafy green vegetables, fresh fruit, milk, dark bread and real butter. Do not use substitutes—you wouldn't do it with a limousine. This high-test fuel is remarkable in that it builds your automobile as well as puts pep in your motor.

Run your human automobile into the garage each night for eight hours of rest. Remember to turn on the fan by opening windows and getting plenty of fresh air. This will prevent flat tires.

Run your automobile body onto the wash rack daily.

Keep the chewing apparatus clean. Brush it morning and night.

Give your human car plenty of water to prevent a dry radiator.

Visit expert mechanics regularly (the doctor once a year and the dentist at least twice a year). They can help you overhaul your machine and discover a little knock in the engine before you hear it.

Put a self-starter on your flesh-and-blood vehicle—that is, remember the main facts about putting pep in your motor every day.—*Ill. Medical Journal.*

BUG MATHEMATICS?

A dusky son of Alabama was busily engaged in a cootie hunt. When asked by a sergeant what he was doing, he replied:

"I'se a-huntin' fo' dem 'rithmetic bugs."

"Why do you call them arithmetic bugs?"

"'Cause dey adds to ma misery, dey subtracts from ma pleasure, dey divides my attention, and dey multiply like hell."—*Medical Insurance.*

Original Articles

THE INFLUENCE OF SODIUM CHLORIDE ON BLOOD PRESSURE*

ROBERT S. BERGHOFF, M. D.
Clinical Professor of Medicine, Loyola University School of Medicine.

ANGELO S. GERACI
Clinical Assistant in Medicine, Loyola University School of Medicine.

CHICAGO

Medical literature of the past two decades can hardly be accused of treating sparingly the subject of sodium chloride and its effects on hypertension. Numerous papers, some of them very excellent and thorough, have appeared in both domestic and foreign publications. Several, it seemed to us, stood out preeminently and possessed unusual interest. Specifically, the work of E. R. Blaisdell and Bernstein is worthy of careful consideration.

However, a serious perusal of the entire field leaves one with a retrospective impression of a vast bulk of scientific theory unsupported with tangible experiment. So that the practically universal acceptance of the dictum that sodium chloride (table salt) is inimical to hypertension, is a pardonable incentive for wonderment under the circumstances. It, furthermore, offers an enticing inducement for original work. It would be wrong to infer that no such efforts have been made and recorded. Witness the experiments of E. G. B. Calvertz, whose conclusions are logical and stimulating and are as follows:

1. Low sodium chloride intake lowers the blood pressure in high blood pressure with no renal damage.
2. High sodium chloride intake is injurious to high blood pressure with renal damage.
3. Low sodium chloride intake is useful in cases of secondary contracted kidneys.
4. Sodium chloride excretion is least in secondary contracted kidneys; better in chronic interstitial nephritis; a little subnormal in arteriosclerosis, and marked and prompt in normal cases.

It seemed to us justifiable, however, to inquire what might be the effect of an unusually high sodium chloride intake over a protracted period, on normal individuals. Granting that such an excess can be an unfriendly circumstance in existing hypertension, might it also act as an inciting factor as a predisposing agent towards hypertension? We turn again to the literature and vainly sought a satisfactory answer. We encountered a dearth of recorded opinion, none, in fact, to the point. Accordingly the following work was undertaken by one of us (A. S. Geraci). Fifty individuals of varied complaints were selected, carefully charted and indexed. A few were hypertensive, but for the most part, as the charts will show, they comprised a hodge-podge of minor irrelevant abnormalities. Four blood pressure readings at weekly intervals were made, and a mean average arrived at before the actual experiment was begun. Thereupon they were given an extravagant allowance of sodium chloride. We experienced an uncertainty as to what proportion that allowance should be—whether to hold it at the figure representing a generous maximum in the average diet, or to grossly exceed it. The latter was decided upon and 3 drams (180 grains) was dispensed daily. At the outset, unforeseen difficulties were encountered. In the first place, individuals there are and none too few, who cannot use salt. This aberrancy runs the entire gamut of antipathy, distaste, idiosyncrasy and actual nausea. In the second place, we were dealing with patients with heterogenous complaints who, if they were to receive no drugs which might interfere with our experiment, refused to accept 3 teaspoonfuls of table salt daily as a cure-all. Both difficulties were obviated by masking the sodium chloride in the vehicle of a capsule of which six ten-grain capsules were given at three-hour intervals, plus two teaspoonfuls in the seasoning.

This therapy was continued over one month, with a careful blood pressure reading each week. We believe the chart which graphically tells the story of the first phase of the experiment is both interesting and instructive.

There then followed one month of no sodium chloride, with weekly blood pressure readings also portrayed in the chart. It was next decided to determine whether the sodium or the chlorine ion was responsible for the rather marked changes noted. Accordingly, six drams of

*Read before Section on Medicine, Illinois State Medical Society, Peoria, May 22, 1929.

TABULATION OF FIFTY CASES

Case Number	Age	Diagnosis	Average Normal Blood Pressure (Four Weekly Readings)	Average Blood Pressure With High Salt Intake (Four Weekly Readings)	Average Increase in Blood Pressure Over Normal (After 4 Wks. High Salt Intake)	Average Blood Pressure With Normal Salt Intake (Four Weekly Readings)	Average Increase or Decrease of Blood Pressure Over Normal With Normal Salt Intake	Average Blood Pressure with Sodium Bicarbonate Intake (Four Weekly Readings)	Average Increase or Decrease of Blood Pressure Over Normal with Sodium Bicarbonate Intake
1.	50	Chronic Interstitial Nephritis....	190/124	226/122	36	202/126	12	180/112	—10
2.	63	Secondarily Contracted Kidney Arteriosclerosis	208/ 96	238/112	30	206/ 96	2	204/ 90	— 4
3.	53	Chronic Interstitial Nephritis...	116/ 94	156/102	40	136/ 96	30	120/ 96	4
4.	58	Hypertension, Arteriosclerosis...	182/ 88	202/ 98	20	196/ 98	14	176/ 84	— 6
5.	47	Hypertension, Mitral Insufficiency	160/100	186/114	26	172/110	12	156/ 94	— 4
6.	57	Arteriosclerosis, Mitral Insufficiency	150/100	176/112	26	168/110	16	152/ 96	2
7.	62	Arteriosclerosis, Chronic Myocarditis	140/120	168/132	28	154/128	14	146/124	6
8.	68	Hypertension, Arteriosclerosis..	172/ 84	194/102	22	186/ 98	14	176/ 86	4
9.	39	Hypertension	188/116	204/130	16	196/122	..	178/102	—10
10.	43	Hypertension, Chronic Cervicitis	180/122	204/128	24	198/128	18	174/104	— 6
11.	70	Hypertension, Chronic Cholecystitis	168/ 70	166/ 70	— 2	164/ 68	— 4	158/ 82	—10
12.	32	Hypertension, Hyperthyroidism..	162/ 70	168/ 72	6	164/ 74	2	154/ 78	— 8
13.	21	Bilateral Salpingitis, Cervicitis..	96/ 70	110/ 82	14	104/ 84	8	98/ 74	2
14.	28	Sebaceous Cyst of Nose.....	114/ 70	142/108	28	122/ 74	8	120/ 84	6
15.	36	Bilateral Salpingitis, Oophoritis.	108/ 60	120/ 68	12	118/ 66	10	106/ 66	2
16.	34	Mitral Insufficiency.....	122/ 60	130/ 64	8	126/ 62	4	122/ 66	..
17.	45	Carcinoma of Cervix.....	126/ 80	130/ 84	4	126/ 82	..	122/ 78	— 4
18.	46	Carcinoma of Cervix.....	114/ 70	116/ 74	2	116/ 68	2	118/ 76	4
19.	43	Menopause	122/ 88	140/ 92	18	136/ 92	14	130/ 90	8
20.	44	Diabetes Mellitus.....	130/ 88	128/ 90	— 2	130/ 90	..	132/ 86	2
21.	36	Chronic Pelvic Peritonitis Salpingitis	108/ 70	110/ 74	2	104/ 70	— 4	118/ 74	10
22.	24	Peptic Ulcer.....	106/100	120/112	14	120/106	14	110/ 88	4
23.	30	Atonic Constipation, Secondary Anemia	148/ 90	138/ 88	—10	142/ 90	— 6	148/ 86	..
24.	32	Tuberculosis of Cervical Glands.	130/ 84	108/ 80	—22	118/ 84	—12	118/ 80	—12
25.	31	Duodenal Ulcer.....	96/ 52	110/ 66	14	108/ 58	12	102/ 58	6
26.	50	Mitral Insufficiency, Chronic Myocarditis	104/ 60	132/ 78	28	130/ 78	26	114/ 78	10
27.	44	Menopause	120/ 78	158/120	38	140/108	20	126/ 84	6
28.	38	Spastic Colitis.....	120/ 60	120/ 60	..	116/ 62	— 4	122/ 72	2
29.	32	Chronic Pelvic Peritonitis.....	130/ 80	132/ 80	2	132/ 82	2	130/ 84	..
30.	34	Atonic Constipation.....	88/ 56	108/ 60	20	106/ 60	18	100/ 62	12
31.	42	Diabetes Mellitus.....	114/ 82	124/ 88	10	120/ 82	6	118/ 78	4
32.	67	Tabes Dorsalis.....	130/ 88	142/ 94	12	136/ 90	6	128/ 90	— 2
33.	28	Cervicitis	128/ 84	146/ 98	18	138/ 88	10	132/ 88	4
34.	29	Chronic Pelvic Peritonitis.....	98/ 64	112/ 70	4	100/ 68	2	92/ 58	— 6
35.	35	Retroflexion, Cervicitis	132/ 78	132/ 76	..	134/ 76	2	134/ 84	2
36.	68	Parkinsons Disease.....	158/ 94	162/ 98	4	158/ 98	..	150/ 88	— 8
37.	34	Cervicitis With Erosion.....	124/ 74	132/ 82	8	128/ 76	4	130/ 80	6
38.	47	Chronic Arthritis	120/ 90	116/ 88	— 4	118/ 92	— 2	124/ 88	4
39.	26	Retroflexion, Cervicitis.....	148/102	154/110	6	154/108	6	142/ 92	— 6
40.	58	Cholelithiasis, Chronic Cholecystitis	154/ 98	156/ 96	2	156/ 98	2	146/ 90	— 8
41.	30	Pelvic Peritonitis with Adhesions	138/ 90	150/ 94	12	148/ 94	10	140/ 86	2
42.	38	Asthma	148/ 90	150/ 88	2	152/ 92	4	144/ 82	— 4
43.	29	Spastic Colitis	120/ 86	126/ 90	6	122/ 90	2	118/ 74	— 2
44.	28	Bilateral Salpingitis	142/ 94	156/ 96	14	152/ 92	10	142/ 84	..
45.	32	Pelvic Peritonitis, Retroflexion..	118/ 72	130/ 78	12	124/ 78	6	122/ 76	4
46.	66	Atonic Constipation	88/ 62	94/ 70	6	92/ 68	4	94/ 64	6
47.	16	Mitral Insufficiency.....	114/ 74	134/ 76	20	128/ 76	14	118/ 78	4
48.	20	Chronic Bronchitis	110/ 82	118/ 86	8	112/ 88	2	114/ 80	4
49.	30	Retroversio-Uteri	136/118	144/126	8	142/122	6	134/102	— 2
50.	34	Mitral Insufficiency.....	116/ 78	132/ 84	16	124/ 80	8	120/ 76	4

sodium bicarbonate were substituted for the sodium chloride and the results again recorded.

It seems to us unnecessary to state that no conclusions are attempted from this brief, crude preliminary effort. Several interesting points can, however, be made.

1. An excessive intake of sodium chloride (six drams) markedly elevates blood pressure in true nephritics and almost equally so in arteriosclerosis.

2. An excessive intake of sodium chloride even in individuals with a normal and subnormal vascular tension, elevates blood pressure.

3. An excessive intake of sodium chloride (six drams) in individuals with organic heart disease and a normal blood pressure showed a pronounced increase in every instance.

4. An equal amount of sodium bicarbonate does not cause similar results.

5. Sodium chloride in doses of six drams daily (approximately twice the maximum consumed in the average normal diet) causes nausea in some individuals.

These observations were carried on in the service of Dr. Robert S. Berghoff at Mercy Hospital, Chicago.

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1. E. R. Blaisdell: "Results of treatment of thirty-five cases of arterial hypertension."
2. M. Bernstein: "Salt restricted diet in the treatment of arterial hypertension."
3. E. G. B. Calvert: "The effect of sodium choride intake on blood pressure." Lond. Practitioner, 1924, cxiii, 193-196.

HYPERTENSION*

SAMUEL EDGAR MUNSON, M. D.
SPRINGFIELD, ILL.

We have read much in both lay periodicals and magazines, as well as in our medical literature in recent years, of the prolongation of life and the increase of longevity. Few public health officials, writing or speaking upon this subject, fail to stress this point.

Fahr[1] quotes Pearl as saying "That during 2,000 years man's expectation at birth has been steadily improving, while at the same time his expectation of life at advanced age has been steadily worsening."

Are more people in proportion to population really passing successfully through the sixth decade and reaching the threescore and ten or beyond than during a century ago?

At the present time we can look forward to an average length of life to about 55 to 58 years for a child when born. This has increased about a score of years during the last century. It is well understood by the medical profession that this has been brought about largely by the control of epidemic and endemic diseases and better living conditions during infancy and childhood today. How about the adult who has reached forty-five or fifty? "His[2] expectancy is scarcely better than his eighteenth century forbearers of the same age."

Of the diseases that endanger the life of an individual who has reached this age, such as cancer, coronary arteriosclerosis, and cerebral arteriosclerosis, blood pressure or hypertension, is no doubt first.

It is estimated by Fahr[3] that 140,000 deaths in persons fifty years or older are due to hypertension or hyperpiesia, wholly or in part, about 23 per cent. of all deaths in all persons fifty years of age or older. This is twice the death rate for cancer, and equal to that of cancer including the respiratory diseases, such as tuberculosis, influenza and pneumonia.

It is generally stated that 50 to 55 per cent. of our hypertension patients die of heart failure, 35 to 40 per cent. of cerebral accident or apoplexy and 10 per cent. of uremia. These figures correspond to Fahr's[4] estimates in the Cardiac Division of the University of Minnesota.

As to the range of what is considered normal and abnormal blood pressure readings, Alvarez[5] in his statistics suggested that "systolic pressure above 130 for women and 140 for men were abnormal, while a diastolic pressure above 90 under forty years of age, and above 95 at ages above forty, definitely increased the mortality and are therefore abnormal."

Systolic blood pressure above 260 are unusual, and above 280 are rare. A diastolic that remains at 110 or above, regardless of rest and approved treatment, has a bad prognosis.

Ninety cases of hypertension, studied in private practice, are the basis of the data given in this paper, as well as the personal conclusions.

TABLE I

Total number cases reported: 90.
Living, 52, or 58%.
Average age of living: 59 years.
Cases living under observation over 10 years: 6, or 6.66%.
  Essential Hypertension: 2.
  Mild Arteriosclerosis: 3.
  Chronic Nephritis: 1.
Per cent. of living in decades:
  Under 50 years of age: 17%.
  Over 70 years of age: 23%.
  60 to 70 years of age: 25%.
  50 to 60 years of age: 35%.

*Read in Symposium on Blood Pressure at Annual Meeting of Illinois State Medical Society, Peoria, May 22, 1929.

TABLE 2

Number of cases dead: 38, or 42%.
Average age at time of death: 67 years.
Of the 38 that are dead, under observation from time of examination until death:
Number dead at end of 2 years: 39.5%.
Number dead at end of 5 years: 63.2%.
Number dead at end of 7 years: 73.8%.
Number dead at end of 10 years: 89.5%.
Number dead who lived over 10 years: 10.5%.
Causes of Death: Cardiac:
Decompensation: 31.6%
Angina Pectoris: 15.5%
Edema of Lungs: 5.2%
52.3%
Cerebral Accident: 34.2%
Uremia: 7.9%
Urinalysis: Casts present in 61% of cases.
Albumin and casts, 45% of cases.

We will endeavor to discuss some of the many causes advanced in the past and that are being considered at present as to the cause of hypertension. The term "hypertension," as generally understood, refers to a pressure of or above systolic 160 and diastolic 100.

Classification, according to Norris,[6] except for an insignificant number of cases due to cerebrospinal pressure, are divided into two great groups:

1. Those without nephritis: Essential Hypertension.

2. Those with nephritis: Malignant Hypertension.

"The idea is gaining ground that chronic hypertension without renal disease results from long continued systemic intoxication with some chemical substances which not improbably may also produce nephritis. In other words, the nephritis does not primarily cause the hypertension nor the hypertension the nephritis, but both are caused by toxic products possibly different, possibly identical in character."

In the so-called essential hypertension cases, there is no evidence of nitrogen retention in the blood, except in the high blood uric acid value, which may be frequently found in this type of hypertension. This was called to our attention by Fischberg.[7] That blood non-protein nitrogen, urea and creatinin are not increased in essential hypertension is generally agreed.

The literature as to the etiology of hypertension is voluminous. More recently that of Fischberg, Jaffe, Fahr, Major, McDonald, Westphal and many others. Some of the numerous theories may be mentioned:

1. That the vascular disease is due to nephritis.

2. Intestinal stasis or infection of the bones, as well as chronic focal infections and severe infectious diseases.

3. The split products of protein digestion, causing intoxication from the metabolic processes.

4. Pressor substances in the blood, acting upon the vasomotor system, causing spasm of the arterioles.

5. Endocrine dysfunction of various types, asssociated with a metabolic disorder and diminished blood calcium content, this lowered calcium content influencing a condition of increased vasomotor tonus and irritability.

6. The recent studies of Major[8] on methyl guanidine and creatinin in the blood indicate these substances are not excreted by certain hypertensives.

He states that:

The results of our observations indicate that many hypertensives belonging to the group of essential hypertension do not, as commonly stated, have a normal kidney function. They are unable to excrete normally two guanidin compounds, methyl-guanidin and methyl-guanidin acetic acid anhydride (creatinin). We do not know whether this deficiency is present in the beginning of the hypertension or whether it occurs later during the course of the hypertension. The further study of this problem is obviously desirable. Its solution may help decide the question whether a deficient excretion of these similar pressor substances is the cause of hypertension or whether this anomaly of excretion is the result of hypertension, and an aggravating complication. At any rate, we feel that this evidence indicates a frequent abnormality of kidney function in arterial hypertension, so that these results justify the conclusion that many patients with arterial hypertension who have a normal blood chemistry, as the term is generally employed, and who have an adequate kidney function when studied by the usual method, show evidence that the kidney is not functioning normally so far as the excretion of creatinin is concerned. It also indicates to us that in hypertensives the creatinin test for kidney function is more sensitive than the phenolsulphonephthalein test.

The more recent studies, particularly those quoted with my own observations, convinces me that kidney changes are present in these hypertension cases much earlier than we had formerly believed, and that all may have kidney complications that do not die earlier from heart failure or cerebral accident.

Jaffe[9] states that in early hypertension the primary renal lesion should be sought in the tufts of the glomeruli and that the fatal spasm

probably occurs in these. This interruption of the glomerular circulation results in the increase of pressure in the afferent arterioles. This distention in the arteriolar wall is the first change that is found after death. Later this is found in the tufts.

The afferent arterioles are also subject to irritating matter, endogeneous or exogeneous, as well as increased pressure in the lumen. This produces in these arteries proliferation of the intima, hyaline and lipoid degeneration which varies according to the injurious agent.

In the cases with a more universal arteriosclerosis, the process in the kidney as a rule is more advanced and more pronounced than in the brain, liver, etc. Only in the kidney is this alteration followed by a well-characterized destruction of the parenchyma, whereas it is absent in the other organs just mentioned. It can be stated, therefore, that the small arteries of the kidney, in particular, are disposed to sclerosis.

The question that arises in our minds when we consider hypertension is whether the hypertension or the lesion of the arteriole is primary. On account of the hypertrophy found in the wall of the arteriole, it is believed that this is secondary to the hypertension.

Keith, Wagener, and Kernohan[10] (Mayo Clinic) summarize the prognosis of severe or malignant hypertension:

In the cases of sustained high blood pressure and diffuse change in the arterioles, the course of the disease is usually rapidly fatal. The terminal clinical picture suggests simultaneous rapid functional failure of the brain, heart and kidneys. This hypertension syndrome can often be distinguished from benign hypertension and chronic glomerulonephritis. The chief points of distinction from the latter are the age incidence, the characteristic retinal picture, the absence of anemia, and the frequent adequacy of renal excretion.

An important study showing that myocarditis with low blood pressure is caused by a previous hypertension in a great majority of cases has been shown by O'Hare, Calhoun and Altnow.[11] They say:

We have fortunately been able to collect a series of fifty cases of chronic myocarditis, showing normal or low blood pressure, in which records of previous blood pressure were obtainable. These we have studied with especial reference to the evidences of retinal arteriosclerosis. Valvular disease, syphilis and hyperthyroidism did not play any part in these cases.

From these studies they state that chronic myocarditis in persons beyond middle life, in the absence of syphilis, hyperthyroidism and valvular disease, is usually vascular in origin. Without doubt the small vessel sclerosis associated with the hypertensive process is the essential lesion, and it is possible to believe that in some cases this lesion may be present in the heart without hypertension. It is their contention, however, "that when the vascular lesion is evident in the eyegrounds it almost always means hypertension present or past."

It is in these cases where there is chronic myocarditis following hypertension and destruction of muscle fiber with coronary sclerosis, that bundle-branch block signs frequently appear.

Postmortem examinations made by Dr. E. T. Bell[13] show only ten per cent. of hypertension hearts have no demonstrable coronary arteriosclerosis. About 55 per cent. have a moderate degree of involvement of the coronaries, which is sufficient to cause demonstrable changes in the heart muscle which adds much to the burden of this already overworked left ventricle. Thirty-five per cent. of these hearts have more definite changes in the coronary vessels showing necrosis of the muscle fiber, still further handicapping these hearts with obstruction of the blood flow.

Foster[14] says:

This term, essential or primary hypertension, was first coined because it was found that an occasional case of high blood pressure showed at autopsy only insignificant disease of the kidneys. There are undoubtedly such cases, but they are uncommon, and even then you understand the latitude allowed the pathologist in deciding what is normal. The symptomatology of nephritis is quite varied and for all that is known to the contrary, it is quite likely that hypertension may often be the only manifestation for considerable periods of time. We have in these diseases a profound metabolic disturbance manifested sometimes chiefly as hypertension, again as frank nephritis, and in other cases as arterial sclerosis. It is premature to hold opinion as to which is cause, which effect. These are subjects for research, not for idle dogmatic statement.

Fahr states that about five per cent. of the hypertension hearts give a history of angina pectoris, either in its classic or less typical form, but none the less definite, and also that hypertension is the background in 75 per cent. of cases of chronic myocarditis.

In the ninety cases selected for this paper, there are about fifteen per cent. with a history of angina pectoris. These cases are all taken

from private practice, which probably accounts for the higher percentage, according to Osler.

Of this selection, eight cases are submitted, illustrating some of the types of hypertension, with observations and blood pressure readings from time of first examination:

No. 1. Mrs. M. F. Living. Age, 64.
Essential or Mild

Examined in March, 1917. Family history negative except one brother died of heart trouble, one sister had nervous breakdown, and second daughter operated on for goiter. Complained of rush of heat and blood to head, which has been occurring for about three years previous. Heart enlarged slightly to left and to right. Liver, two fingers below costal arch. Teeth in poor condition; some extracted in October and more in 1920. Began two hours rest of afternoons in 1924; showed sugar in urine. In 1926 had swelling of ankles and feet. No albumin in urine, but sugar still present; pus cells; no casts. With further restriction of diet showed no sugar in 1927. Feeling very well in April, 1929, with restricted amount of household responsibility.

	Blood Pressure	
1917	S.	D.
March	165	125
October	170	122
1920		
January	220	120
1923		
March	222	120
1924		
January	230	130
1925		
February	210	118
May	210	100
1925 (Cont'd)		
November	190	120
1926		
April	210	110
1927		
March	190	106
September	198	106
1928		
January	204	115
February	220	120
April	160	90
May	180	100

No. 3. Mrs. J. P. Living. Age, 58.
Nephritis

Albumin present, four plus, in 1917; numerous casts. Functional kidney test: Right kidney, 25%; left, 28%.

	Blood Pressure	
1917	S.	D.
July	184	122
1918		
July	220	140
August	210	130
1921		
February	210	120
March	220	120
December	210	120
1928		
March	170	100

Albumin still present, four plus; many casts.

No. 8. Mr. J. H. C. Living. Age, 78.
Arteriosclerosis

Examined in June, 1918. For several years had been slightly overweight. Sugar was present in urine at time he had a carbuncle in 1911. Heart was 14 c. m. to left, mid-sternal on right, and sub-sternal dullness 5 c. m. to left. Had nocturia for many years. Able to be about at present, but quite feeble.

	Blood Pressure	
1918	S.	D.
June	198	120
September	170	90
1919		
April	170	110
1927		
January	200	100
1928		
August	170	70

No. 71. Mrs. G. R. Living. Age 52.
Cardio-Nephritis

Examined in September, 1928. Patient overweight, with cardiac symptoms; gas in stomach and abdomen for some time. In June, 1928, started on a trip; short distance from home became very sick, with difficult breathing; couldn't speak, choked and coughed; had severe precordial pains; attack lasted few hours and returned home. While digging and planting flowers, month before, had similar attack which lasted about an hour. History: Has had a weak heart. Formerly weighed 250. Appetite very good. Aching in back of head. Sleeping poorly. Heart is enlarged to left, with diastolic murmur over base. Functional kidney test: 32½%. Patient was placed on diet: P. 50 gms., F. 30, C. 75. Present weight, 181. Total loss of 56 pounds. Has had no re-occurrence of her former attacks of precordial pain and gas distention.

	Blood Pressure	
1928	S.	D.
September	220	120
October	210	110
October	164	86
November	180	90
December	180	70
1929		
February	160	80
March	150	80
April	170	90
May	160	80

No. 74. Mr. C. M. E. Deceased. Age 60.
Malignant or Severe

Examined July, 1925. Age 59. Weight 116. Small stature. Left heart at anterior-axillary line; substantial dullness increased 5 c.m. to left and some to right. Pulsations of carotids very noticeable. Marked evidence of blood vessel sclerosis, including aorta. Teeth in bad condition.

Urinalysis: Sp. Gr. 1008. Albumin and casts present. Under rest and treatment, blood pressure was reduced after a few months. Attack of influenza in February; gradually improved. Symptoms became more grave and entered hospital in July; remained about eight weeks; gradually grew worse; was given liver injections. Died September 1, 1926, symptoms of uremia and cardiac failure. Family were advised at time of first examination that patient would not likely live more than a year. Lived fourteen months.

	Blood Pressure	
1925	S.	D.
July	230	110
July	186	98
August	230	110
September	210	110
December	238	118
1926		
February	240	110
March	220	110
April	228	120
June	200	100
August	230	120

No. 78. Mr. J. F. M. Deceased, age 76.
Angina Pectoris—Coronary Occlusion

Examined April, 1922, age 73. Complained of pain around right shoulder. Family history practically negative. No sickness as a child except measles, severe, and occasional attacks of pleurisy, not severe. Had distress in stomach and bowels for many years; had traveled and used restaurants. Of nervous temperament; had financial losses with worry at times. Had nocturia for many years. Arteries moderately sclerosed. Heart enlarged to left and accentuation of second

aortic. No arhythmia. Advised about exercise—golf. Teeth were x-rayed and some extracted. Mild infection of pyelitis, colon bacilli, right kidney. In September, 1922, complained of shortness of breath, especially on exercise. The following three winters were spent in Florida. About three weeks after his return played 18 holes of golf, in a foursome. The following morning had an attack of coronary occlusion and died in spasm three days later. Lived three years after examination.

	Blood Pressure	
1922	S.	D.
April	168	110
June	170	110
September	150	100
1923		
December	160	80

	Blood Pressure	
1924	S.	D.
April	140	86
December	160	98
Died April 16, 1925.		

No. 26. Mrs. J. L. Deceased. Age, 65.

Angina Pectoris—Coronary Occlusion

Examined March 7, 1922.

Family History: Mother died, 72, heart failure; father, 73, heart trouble. At age 18 weighed 113, but gradually increased to 207-218. Active, worked hard, and was nervous. At time blood pressure improved was living in city. Later moved to country residence for about five years; was more active and worked harder. Began rest in afternoons on account of dizziness and shortness of breath; began to be troubled with nocturia. On account of weight was advised to reduce sugar and salt in food. Returned to city home past two years; not under treatment until present sickness, March 23, 1929. After washing and hanging curtains became very dizzy with shortness of breath, gas distention, pain over left chest and radiating to neck and left arm. Blood pressure was S. 220, D. 120. Was removed to hospital for three weeks, but difficult to keep quiet. Returned home April 20 and had attack at four o'clock in the morning, with severe pain in left side and upper abdomen. At eight o'clock pain severe, with vomiting, sweating, and unable to lie down; sat on edge of bed in fixed position. Symptoms continued and only abated by morphin hypodermically. Heart was fairly regular but weak, with symptoms of decompensation; rales at base of lungs. On the evening of April 25, after taking nourishment, she died suddenly. No autopsy held. I believe this case died of coronary occlusion. Lived seven years from time of first examination.

1922	S.	D.
March	210	110
April	160	92
September	200	100
October	180	110
October	200	90
November	220	120
December	180	100
1923		
January	200	100
May	150	86
December	180	90

	Blood Pressure	
1924	S.	D.
January	150	90
April	170	90
1926		
January	184	88
April	210	100
1927		
November	204	96
1928		
January	178	86
1929		
March	220	120

No. 51. Mr. L. M. Deceased. Age, 65.

Myocarditis with Bundle Branch Block

Spent a year at Battle Creek Sanitarium before came under my observation in January, 1921, age 61. On account of shortness of breath and precordial pain, was advised not to play more than one or two holes of golf. Gradually overcame a decompensation by disposing of all his business and devoting himself to the recovery of his health, and could finally comfortably play nine holes of golf. As he improved he became more difficult to control in his exercise and activities, and with a return of an anginal attack he died some hours later while asleep. Electrocardiogram had shown bundle branch block signs three years before. Lived five years after first examination.

	Blood Pressure	
1922	S.	D.
April	180	96
June	140	100
October	162	102
November	150	100
December	140	100
1923		
February	150	100
March	150	96
May	138	88
June	150	90

	Blood Pressure	
1923 (Cont'd)	S.	D.
August	160	100
December	158	90
1924	S.	D.
January	160	90
March	164	94
May	160	80
June	160	100
1925		
December	140	90

We have discussed the earliest possible changes in the kidney and elsewhere that may be the beginning of hypertension. May we also consider some of the many causes of the departure from normal health that are probably casual factors in producing these changes that are found in early hypertension.

As Draper has shown that there is definite tendency to inherit heart disease, so there is every possibility that there is a much greater tendency for hypertension to be found in a definite family history.

When we are confronted with a case of hypertension for study, when the physical examination has been done and the laboratory findings completed, we write our conclusions and summary. Not unlike the real pictures upon the canvas,—first there is the definite background, then comes the various colorings and shadings from the blending of the paints that produce outline and form, and the picture gradually appears in reality. So in this clinical picture, we can see the family background with environmental conditions from birth to the age of senescence. When we consider treatment each picture must be studied individually, and frequently the entire background of life's habits repainted or entirely changed and the physician, instead of a painter on canvas, becomes a teacher, thereby changing or repainting the clinical picture.

In the treatment of these cases, I am often reminded of a statement made by S. Weir Mitchell that he had seen few cases of neurasthenia that could not be relieved or cured by a check of sufficient size to make them comfortable.

So with these cases of hypertension, where they can be made comfortable, I am sure we can prolong their lives and make them useful, five to ten years, and even in a few of the early cases, longer. It is the vicissitudes of life from infancy to old age that confronts the hypertensive, that causes him to falter and succumb early or later in his efforts to reach the home port in the good ship Old Age.

Patients that are not improved in both reduction of blood pressure and comfort by physical and mental rest, with suitable diet and sedatives, over a period of six weeks, have progressed to the point of more or less kidney changes or malignant type of hypertension.

Much is said about advising these patients to stop work. If a patient for many years has had yearly or bi-yearly health examinations with close observation, we may safely be more liberal with our advice. The prognosis for a patient with hypertension beyond the sixth decade with a diastolic pressure that can be kept between 90 and 100, with moderate pulse pressure and a well regulated life, may be eight or ten years. This, of course, becomes less in proportion to symptoms of kidney involvement, such as a thalein output of less than 30 per cent. fixed low specific gravity, excessive output at night over the day, as well as increased total amount in twenty-four hours. An additional help will be the entire Mosenthal test, with blood urea and non-protein nitrogen.

Rest: Everyone agrees that rest, relaxation, absence from worry, are all necessary and desirable. To succeed with a patient we cannot be satisfied to tell them to rest, to relax, not to worry, to quit business, to turn a deaf ear to all domestic disturbances, but we must help him to approach each of his difficulties separately and after a reasonable analysis to reach a solution that will give our patient rest from both physical and mental activity.

Business associates and members of the immediate family must be admonished to refrain from all sources of irritation and in every way co-operate with the physician. No doubt the character of our advice should depend in these cases upon the time of life and the period of the disease when these patients consult us.

Bishop's warning as to the time of day for exercise is timely and should guide the physician in his advice to his hypertension patients, particularly the cardiac type. The principle that exercise should be taken before the activities of the day and not afterward is an important one, that the patient walks out of doors before noon daily and continues to the point of slight fatigue, with rest from lying down until refreshed after lunch. The hypertensive patient past middle life who takes exercise, golf, etc., after his day's work can benefit little from it.

The physician must have experience and skill in being able to determine at what point of this journey his patient has reached that comes to him for advice. This means that we must know all the earmarks of this disease and the order of their appearance, that we may be able to interpret the manifold symptoms and actually determine at what point of the journey the hypertensive has arrived when we see him. Without this knowledge of our patient we cannot decide as to the amount of rest, work or exercise a patient must have, nor as to diet and medication.

How much rest must we advise for a patient with these symptoms? You want to know his age and weight, blood pressure, condition of heart, kidney function and conditions of environment. I have long been convinced that we frequently see these patients the first time with blood pressures that are moderate, 150 to 160, diastolic about 100, that at an earlier time have been hypertensives.

In these cases where there are symptoms of myocardial weakness, the eye-grounds should be examined for retinitis. Altnow[15] states that "retinitis resulting from hypertension may be indistinguishable from renal retinitis, thus producing certain changes, such as marked papilledema, retinal edema, cotton wool spots and coarse fan and star-formation that suggest renal involvement. In retinitis caused by hypertension, these changes are less frequent, but all may occur. It is suggested that such difference in appearance as exists is probably due to the rate at which the degenerative changes occur." So

we see these cases with chronic myocarditis and only from an examination of the eye, find a retinal arteriosclerosis indicating a previous hypertension.

A careful evaluation of a patient as a surgical risk in all forms of suspected heart impairment from hypertension should be carefully observed by the surgeon.

It should be our effort to treat these hypertensives as expediently as possible, because the earlier cases will require a long time to get them to fit into a proper regime to stay the advance of the disease or hold it in abeyance, and the more severe ones to postpone any of the serious accidents that may cause death or disability, total or partial, that makes life a burden to both the patient and family.

Most that has been advised in the treatment of this disease has been proven worthless. Low protein (no lean meat), salt-free diet, liver injections, spas abroad and springs in our country, have all been highly recommended, only to bring disappointment. As pointed out by Van Norden of Vienna, many years ago, indiscriminate amounts of water drinking, exercise, and bathing which are recommended at these spas, cause many hearts that are compensated to become decompensated.

In advanced or malignant hypertension, a low protein and reduced salt diet is of distinct advantage, but of no material benefit in cases with kidneys showing no albumin, few casts, waxy or granular, with a thalein output of 50 per cent. or better. Those who have tried Major's Liver Treatment, with few exceptions, consider it to be of any distinct value. I have only tried it in my cases that had kidney involvement, with no results.

As stated by Mosenthal,[16] "The best available means at the present moment to reduce the blood pressure in essential hypertension is to obtain nervous relaxation in the patient." As he states, this is glibly said but hard to accomplish, for it means untold effort upon the physician's part and limitless cooperation by the patient. Occupation, home life, social obligations and many other factors must be studied and their rough corners rounded off.

Those who have comfortable means but who have led a life of "hurry and worry" can scarcely be controlled, but can arrange their business affairs and domestic life so that living is made more comfortable. With one of limited circumstances who has to depend upon their work from day to day to support a family, it is difficult to obtain rest and relaxation, either physical or mental.

There is no doubt of the value of the removal of sources of infection, but this should be advised judiciously. Only one or two of the worst infected teeth should be surgically extracted at one time, followed with rest in bed when there is any tendency to heart impairment or diminished kidney function. Hypertension without these symptoms of heart and kidney is no bar to necessary surgery.

Treatment: Rest and peace of mind must be secured if possible. Some of the older remedies are very effective for this purpose, such as S. B., Gr. XV, at 11 A. M., 5 P. M., and 9 P. M., Chloral hydrate, where there is precordial pain, Gr. V to XV, at night, repeated if necessary. Some of the newer drugs, Barbital Gr. V at 7 P. M., Allonal, two tablets, or Phenobarbital, Gr. 1½, are all effective. For relaxation, morphin, Gr. ⅛, is often found useful.

Blood letting, if necessary, in sthenic cases, with nitroglycerine. Rest in bed, free catharsis, and diet reduced to less than 1000 calories—P. 40, F. 50, C. 75.

Symptoms of heart failure and fibrillation must be treated by digitalis.

When there is edema, Theocin, Gr. 1½ on the first day, t.i.d., five times on the second day, and if no diuresis, six to eight on the third day. Novasural and Ammon. chloride may be tried; 8 gms. Ammon. chl. the day before the Novasural is injected.

Where there is recovery from decompensation this condition can be maintained longer when the patient does not have to work, but it will reoccur again sooner or later with some form of attack of coronary thrombosis that closes the scene, or if only a branch of the coronary artery, a slow recovery (three months in bed) to die later from terminal pneumonia due to decompensation.

There have been some favorable reports of the use of Sodium sulphocyanate in the reduction of blood pressure in hypertension uncomplicated.

A drug that has been used quite successfully with the cardiac complications of hypertension

with severe pain, angina pectoris and its various phases, is Theophylline-Ethylenediamine. This drug was used in 200 cases of heart disease associated with pain, in the clinics of the Charity Hospital, New Orleans, by Drs. Musser and Hermann.[17] This was for the purpose of increasing coronary flow.

Thyroid gland medication is of value, carefully administered, in the obese cases. As stated before, the judicious removal of all foci of infection is important.

Conclusions:

1. The so-called essential or benign hypertension is the earliest symptom of a mild hypertension that may become severe under longer periods of observation.

2. In view of the more recent studies it would appear there are more frequently early structural changes found in the kidney and vascular system than had formerly been believed.

3. For this reason, in considering this disease, our attention should be directed to its earliest possible causes and manifestations.

4. We again emphasize the importance of treating the various complications of hypertension the same as when it occurs as a complication of other diseases.

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HYPOTENSION*

ARTHUR I. KENDALL,

CHICAGO

Dr. Munson has just told you of the really extraordinary increase in the expectancy of life, which has been a gift of medicine to humanity in the last quarter century. That has taken place in the face of a decreasing birth rate, and means, of course, that many more people reach middle age.

The ways in which this achievement has been brought about will perhaps give you some clue to the particular phases which I want to speak about today.

The significant decrease in the death rate has been in the group of infectious diseases principally, and the widespread increase in the use of sterilized and pasteurized foods and drinks furnish probably the explanation for this really very remarkable achievement.

If you will stop to think about it, we are rather rapidly approaching the theory, at least, of the perfectly pasteurized man. Our water supplies are sterilized, we eat tinned foods to a considerable degree and there is very little that is not subjected to chemical or heat sterilization or pasteurization.

This has apparently some effect upon the microbes that inhabit the intestinal tract. You realize that an average adult enjoying an average diet excretes some thirty millions of millions of bacteria a day. It may not be without some significance that alteration in food may be responsible for reciprocal effects upon the intestinal bacteria. Before the days of pasteurization the lactic acid bacteria that are very commonly present and abundant in nature were taken with the food and now these organisms are very largely eliminated.

On the other hand, spore forming organisms that can resist pasteurization temperature are disproportionately supplanting the lactic acid bacteria and it is a possible relationship of one of these spore formers to hypotension that I want to direct your attention to today.

If you will think over the cases that come to you as practitioners you will perhaps recall an

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occasional patient who complains of somewhat indefinite symptoms, and these are, first of all, undue fatigue. Also your patient is very likely to complain of constipation; he may waken in the early morning with rather indefinite symptoms of discomfort, and if you take his blood pressure you will very likely find it is rather below the normal for the age.

These persons ordinarily are not particularly ill. They are enjoying what Robert Koch called "a state of rude health."

In a series of some ninety of such cases which I have seen from time to time, I have been able to find an organism whose name you are all familiar with—the gas bacillus: that sinister organism that during the World War caused the gas gangrene. But the one under discussion is not the common, ordinary, garden variety of gas bacillus; it is one that produces a particular sort of chemical substance that, so far as we have been able to identify it, is rather closely related to histamin.

Strikingly enough, this microbe does not produce this substance, which is of protein origin, from purely protein media.

It is produced as a by-product during the active fermentation of sugars, and this is rather significant, in view of the fact that these particular cases I am speaking about are in reality cases of carbohydrate intolerance. It is not carbohydrate indigestion strictly speaking, because there is nothing at fault with the digestion. Rather the condition is attributed to the extraordinary avidity of this gas bacillus for carbohydrate, and the consequent liberation of this histamin-like substance that seems to be responsible for the difficulty.

Experimental evidence of the correctness of the explanation is not difficult to obtain; even extremely small amount of cultures of this microbe injected into the blood stream of suitable animals will cause a depression of blood pressure. If the same substance is added to physiological solutions in which strips of smooth muscle are suspended, these will contract. Not only that, but if this substance (or substances, it may be a composite substance) is added to the mucosa of the small intestine, the small intestine will contract, suggesting that the substance passes through the mucosa to the underlying smooth muscle.

I realize, of course, that these are circumstantial facts rather than definitive proof, but proof in medicine is difficult to achieve.

A word about the conditions under which this gas bacillus thrives in the alimentary canal. In the first place, the gas bacillus is quite sensitive to lactic acid, and, therefore, the deficit in active lactic acid producing bacteria that I mentioned a moment ago seems to be a significant factor. If you were to examine the microbes of the alimentary tract in these cases you would find that lactic acid producing bacteria are limited in numbers and rather sluggish in their activities.

The associated intestinal organisms we are not particularly interested in; they merely bear out the statement I have made.

It is, of course, more or less interesting to speculate upon the origin of cases of this sort, but from the practical point of view, prevention, or, more accurately, amelioration, is of infinitely greater importance. Fortunately, these cases are amenable to dietary treatment.

From what has been said you have already grasped the theory, at least, underlying the handling of these cases from the dietary point of view.

The principle involved is to restrict carbohydrates as much as possible, and to push buttermilk. The term "buttermilk" is, parenthetically, a delicious misnomer. It is milk from which everything that can give rise to butter is eliminated. Also the varieties of buttermilk that may be purchased in one place or another are very numerous. The only buttermilk that is of avail in the particular sort of cases we are considering is that which contains relatively large amounts of preformed lactic acid.

Milk of this sort has two advantages. The first one: the lactic acid, which is already present. And, secondly, the reduction in milk sugar which follows from the fact that lactic acid has taken place.

It is perfectly feasible to make lactic acid milk by the simple expedient of adding lactic acid to it. This is not, however, quite as satisfactory as the soured milk produced by microbic activity. But it is much better than milk which is obtained by the process of sweet churning, which is not only useless, but is actually harmful in these cases of hypotension we are discussing.

I mention this because there is a great deal

written about lactic acid milks of one sort or another, and there is a great deal of misinformation and faddism in the voluminous lactic acid literature.

What is needed is preformed lactic acid to antagonize the growth of the gas bacillus, and when lactic acid milk is administered in considerable amounts the lactic acid gradually crowds out or at least restrains the activity of the gas bacillus and the patient slowly improves.

It is also necessary to reduce as far as may be the carbohydrates in the diet and here may I point out that there seem to be idiosyncrasies to this group of substances. Some persons are tolerant of potatoes and others are tolerant of other carbohydrates. There seems to be no way of predicting, and it is necessary to determine by experiment what the idiosyncrasies are.

The addition of a certain amount of protein to the diet does no harm, and it seems in most instances to be beneficial.

You will, doubtless, find in a proportion of the cases, that the hydrochloric acid of the stomach is either deficient in amount, or perhaps even absent. That is a factor that can be artificially controlled in ways that are perfectly obvious, however.

These cases of carbohydrate intolerance associated with hypotension are usually cases of rather long standing. Some of them have gone on for weeks, months, and years. I have one in mind that was apparently suffering from this low grade derangement for a period of seventeen years. This, of course, indicates that the condition is not deadly. It is one, however, of considerable discomfort.

To summarize all of this, then. There seems to be a group of cases in which there is a rather indeterminate series of symptoms, no one of which is characteristic, but all, taken together, are extremely suggestive.

In a series of these cases it has been possible to find a particular sort of microbe. This microbe produces certain substances which will, when introduced in an appropriate manner into the body, reproduce the essential symptoms which are associated with this condition. This microbe has a perfectly definite series of chemical characteristics; by taking advantage of the likes and dislikes of the microbe it is possible to bring it under control; and when this is done, the patient undergoes slow but definite restoration to his normal condition.

HYPERTENSION—CLINICAL INTERPRETATION*

HERMAN O. MOSENTHAL, M. D.
NEW YORK

Hypertensive states may be classified in several ways, each of which furnish conceptions that are of distinct aid in the diagnosis and treatment of high blood pressure. An elevated blood pressure may be grouped according to its cause, that is, on a physiological or a pathological physiological basis; this, if carefully carried out, does away with the danger, which is a real one, of making the diagnosis of hypertension too simple by quoting a systolic pressure only and thus dividing the human race into three classes, those with an average blood pressure and those with hypo- and hypertension. This is frequently done; it is a quick and easy way to quote a systolic pressure of about 200 and to think of it as signifying potential destruction for such a person in terms of heart failure, apoplexy or uremia. On the other hand, a great deal of skepticism has been engendered in regard to the interpretation of such high blood pressure readings because these patients frequently enjoy their normal alloted span of life in spite of a high systolic pressure. The error lies in the fact that hypertension is the result of many factors which not only have widely different prognostic significance but also require various therapeutic measures if they are to be treated effectively. An analysis of hypertensive states is given in Table 1.

TABLE I—TYPES OF INCREASED BLOOD PRESSURE — PATHOLOGICAL PHYSIOLOGICAL CLASSIFICATION OF HYPERTENSION

(A) Constitutional, or
(B) According to the Elvation of Systolic or Diastolic Pressure or Both.
  Group I — Increased Systolic and Low Diastolic Pressure.
    (a) Large Pulse Volume (heart-block, aortic insufficiency, hyperthyroidism).
    (b) Loss of Elasticity Throughout a Greater Part of the Arterial Tree (arteriosclerosis, old age).
  Group II—Increased Systolic and Diastolic Pressure.
    (a) Primary Increased Peripheral Vasoconstriction.
    (b) Primary Increased Arterial Tone.
    (c) Combination of (a) and (b).
  Group III—Comparatively low Systolic and high Diastolic Pressure (myocardial insufficiency).

*Read before Section on Medicine, Illinois State Medical Society, Peoria, May 22, 1929.

In this table the pathological physiological classification is intended to clarify the diagnosis and therapy of increased blood pressure. There are two points, especially, that are worth while accentuating, before these conditions are taken up in detail; these are, first, that there are many and diverse causes for the elevation of systolic pressure, and, second, that the diastolic pressure, often not even mentioned in describing hypertensive states, is of equal if not greater importance than the systolic pressure.

Average figures for blood pressure are now available in sufficient numbers to make these observations of permanent value. Tables 2, 3 and 4 are examples of such data.

TABLE 2—BLOOD PRESSURE IN NORMAL CHILDREN. (JUDSON AND NICHOLSON[1])

Age	Systolic Pressure	Diastolic Pressure	Pulse Pressure
3	91.8	65.6	26.2
4	91.6	64.9	26.7
5	91.3	64.4	26.9
6	92.6	67.3	25.3
7	94.0	66.3	27.7
8	93.6	64.7	28.9
9	94.3	71.0	23.3
10	99.2	67.1	32.1
11	97.1	65.5	31.6
12	102.3	65.2	37.1
13	103.6	70.5	33.1
14	106.1	67.4	38.7
15	105.6	67.5	38.1

TABLE 3—AVERAGE NORMAL BLOOD PRESSURE ACCORDING TO ARTHUR HUNTER[2] IN APPROXIMATELY A QUARTER OF A MILLION HEALTHY INDIVIDUALS

Age	Systolic Pressure	Diastolic Pressure	Pulse Pressure
10	103	70	33
15	113	75	38
20	120	80	40
25	122	81	41
30	123	82	41
35	124	83	41
40	126	84	42
45	128	85	43
50	130	86	44
55	132	87	45
60	135	89	46

TABLE 4—BLOOD PRESSURE READINGS IN MEN AND WOMEN AGE 65 TO 94 ACCORDING TO BOWES[3]

Age	Number Examined	Systolic Pressure	Diastolic Pressure	Pulse Pressure
65-69	32	151	82	65
70-74	39	160	86	73
75-79	38	166	86	79
80-84	27	175	84	83
85-89	7	170	90	77
90-94	7	142	81	61

An easy figure to remember as a guide to approximately normal blood pressure in adults is that at age 20 the systolic pressure should be in the neighborhood of 120 and the diastolic at a level of about 80 mm. of mercury. From a study of tables 2, 3 and 4 it can readily be seen that the popular idea of considering a normal blood pressure as equal to 100 plus the patient's age is fallacious. Furthermore, such a rough and ready rule does not consider the diastolic readings, which from a clinical point of view are of greater significance than the systolic.

Average values of blood pressure as given in tables 2, 3 and 4 do not furnish the upper and lower limits of normal. These are given in tables 5 and 6. It is apparent in these tables that the

TABLE 5—PROBABLE LIMITS OF NORMALITY IN BLOOD PRESSURE READINGS AT VARIOUS AGES (STOCKS AND KARN)[4]

Central Ages	Outside these limits pressures are almost certainly pathological: Systolic	Diastolic
7	59-128	34-86
8	62-131	35-85
9	66-135	36-88
10	69-138	38-90
11	72-141	40-92
12	75-144	42-94
13	80-149	45-97
14	84-153	47-99
15	89-158	49-101
16	93-162	51-103
17	95-165	52-104
18	97-166	54-106
19	.....	57-109
20-24		59-111
25-29	98-167	58-110
30-40		55-107

TABLE 6—BLOOD PRESSURE OBSERVATIONS IN MEN AGE 75 TO 92 ACCORDING TO THOMPSON AND TODD[5]

Syst. Press. mm. Hg.	No.	Diast. Press. mm. Hg.	No.	Pulse Press. mm. Hg.	No.
0-129	18	0- 29	3	30- 49	8
130-149	31	30- 49	0	50- 69	35
150-169	23	50- 69	22	70- 89	32
170-189	20	70- 89	54	90-109	17
190-209	7	90-109	21	110-129	7
210-229	1	110-129	2	130-149	2
230-249	2			150-169	0
				170-189	1

These figures show how impractical it is to speak of a normal average blood pressure in people of advancing years; apparently there is a characteristic blood pressure which each individual acquires as he grows older. This may be considered the physiological expression of the changes that occur in the cardio-vascular system of each person.

TABLE 7—BLOOD PRESSURE RECORDS IN A CASE OF CONSTITUTIONAL HYPERTENSION

Date	Blood Pressure Systolic	Diastolic	Date	Blood Pressure Systolic	Diastolic
1912	145	..	1923, July.....	140	96
1917	142	98	1924, January..	148	98
1919, February.	142	96	October..	148	100
December.	152	98	1925, March...	140	92
1920, June.....	154	100	November	152	100
December.	142	100	1926, April....	152	102
1921, August...	158	104	July.....	146	97
December.	142	98	1927, January..	142	98
1922, September	140	90	October..	154	102
November	150	96	1928, April....	142	101
1923, May.....	160	100	May.....	154	100

Male, age 50; the highest and lowest blood pressure readings of each year are the only ones charted. (Mosenthal).[6]

variations from the average may be very great. This makes it evident that some persons have an arterial tension which is higher than the accepted average standards. An example of this sort is given in table 7. In the present classification such instances have been designated as constitutional hypertension, thus indicating that in these individuals the body is so adjusted that it maintains a rather high blood pressure; one great difference between such instances of constitutional hypertension and the diseased state, essential hypertension, is that the blood pressure remains constant and shows no tendency to rise from month to month or from year to year. These cases of constitutional high blood pressure usually do well and do not have a poor prognosis.

The second part of the classification indicated in table I is according to the elevation of systolic or diastolic pressure or both. Table 8 furnishes examples of the possible relation between these factors. A large pulse volume occurring in conditions such as heart block, aortic insufficiency or hyperthyroidism will bring about an increased systolic pressure without influencing the diastolic pressure in an upward direction. Read[7] reports a case of heart block with a pulse rate as low as 28 and a blood pressure reading as high as 240/100. Any pulse pressure above 60 should lead the clinician to suspect either the presence of an aortic insufficiency or of hyperthyroidism. This does not hold true in all instances, but it is a very helpful hint in diagnosing many cases.

TABLE 8—SHOWING THE VARIOUS RELATIONS THAT MAY EXIST BETWEEN SYSTOLIC AND DIASTOLIC BLOOD PRESSURES

Blood Pressure Syst.	Diast.	Remarks
230	92	Group 1—Examples of comparatively low diastolic pressure and markedly increased systolic pressure.
184	90	
220	98	
180	95	
225	94	
200	96	
234	134	Group 2—Examples of simultaneous increase of systolic and diastolic blood pressure.
232	132	
200	130	
245	140	
280	136	
230	135	
170	120	Group 3—Examples of increased diastolic pressure with a comparatively slight rise in systolic tension; these cases are comparatively rare.
177	120	
161	120	
190	130	
170	110	

When we trace the average blood pressure values from childhood (table 2) through adult life (table 3) to old age (table 4) it becomes very evident that the systolic and diastolic pressures both rise with advancing years. However, they do not increase equally; the systolic pressure rises very much more rapidly than the diastolic pressure; this is very graphically expressed in the mounting difference in successive ages between the systolic and diastolic blood pressure, which is known as the pulse pressure. The very high values of the systolic and pulse pressures in the aged as compared to those in children must be the result of some fundamental changes in physiology or anatomy that are characteristic of growing old. This process begins in the earliest years, as may be noted in table 2. It is believed that the increasing stiffness of the arteries (that is, the tubing which carries the blood from the heart to the peripheral arterioles) brought on by arteriosclerosis is responsible for the rise in systolic pressure with advancing years. The more rigid and unyielding the arteries are the higher the systolic and the lower the diastolic pressure must obviously become. Up to the time when old age is reached the arteriosclerosis develops to about the same extent in everyone; above 60 to 70 years of age, this degenerative process apparently varies a great deal in its intensity in different persons; the great diversity of systolic pressures characteristic of these years indicates this fact. Arteriosclerosis may, therefore, be regarded as another cause for an increase of systolic pressure without a corresponding rise of diastolic pressure, and is so classified in table 1. An ex-

ample of this type of change may be found in table 9.

TABLE 9—BLOOD PRESSURE READINGS, FEMALE, AGE 55

Date	Blood Pressure		Date	Blood Pressure	
1926	Syst.	Diast.	1927	Syst.	Diast.
Aug. 2....	193	77	Jan. 15....	178	80
Sept. 16....	184	93	Feb. 12....	169	68
Oct. 19....	198	88	March 12..	169	69
Nov. 6.....	166	66	April 9....	166	72
Nov. 20....	162	70	May 7.....	182	79
Dec. 18.....	176	78			

Indicating how the systolic pressure may be raised without a corresponding elevation of the diastolic pressure. Such changes are common in cases of arteriosclerosis and in women after the menopause, and are not to be confounded with cases of essential hypertension in which the diastolic pressure as well as the systolic is above the normal.

An elevation of systolic as well as diastolic pressure may be brought about in two ways: there may be a vaso-constriction of the arterioles at the periphery of the arterial tree resulting in an increased resistance to the blood flow, or there may be a primary increase in tone of the larger arteries, followed by a compensatory narrowing of the arterioles. A primary increase in peripheral resistance has heretofore generally been regarded as the cause of the disease usually spoken of as essential hypertension. There are some cases that may definitely be placed in this category. An example of this sort is given in table 10. The clinical characteristics of these

TABLE 10—MRS. X, AGED 64

Date	Blood Pressure		Date	Blood Pressure	
1923	Syst.	Diast.	1925	Syst.	Diast.
Sept. 29..	230	120	Jan. 12..	120	80
Oct. 10..	230	120	Jan. 26...	130	80
Oct. 26..	195	125	Feb. 25..	180	100
Dec. 3...	150	95	Mar. 19..	80	60
1924			Apr. 6...	135	95
Feb. 7...	120	80	May 11..	130	85
Apr. 26..	130	90	June 20..	150	100
June 27.	250	140	Aug. 7...	160	80
July 11..	195	115	Sept. 9..	190	120
July 28..	115	70	Sept. 26..	210	110
Sept. 10..	195	90	Oct. 3...	230	120
Oct. 2...	115	70	Oct. 7...	210	135
Oct. 17..	115	75	Oct. 13..	235	135
Nov. 17..	180	110			
Dec. 3...	120	80			

Subject to sudden fainting spells, has "dead fingers" and "dead toes" at frequent intervals, periodic looseness of the bowels without cause and several attacks of blurred vision. All these facts point to an intermittent peripheral vaso-constriction. This is apparently the cause for the variable blood pressure found in this case. (Data from Dr. I. W. Kingsbury.)

patients are that they exhibit intermittent signs of spasm of the arterioles, such as fainting spells, "dead fingers," "dead toes," diarrhea, blurred vision, asthma, etc. Table 10, for the data of which I am indebted to Dr. I. W. Kingsbury of Hartford, Connecticut, is the very best example of this sort I have seen. It will be noted that the blood pressure varied remarkably in this case, presumably in accordance with the degree of peripheral vaso-constriction existing at any one time.

Various studies of the arterioles in hypertensive states have revealed some very interesting facts. Boas and Frant[8] have shown that in most instances of hypertension the capillary pressure remains normal, indicating that the peripheral resistance is adjusted so that the capillary flow and the blood supply to the tissues is unchanged. The observations of Krogh,[9] Richards[10] and many others demonstrate that the amount of blood flowing in the capillaries of voluntary muscle, kidney and other tissues is directly proportional to their needs, independent to a great degree at least of the blood pressure. Thus the arterioles may be regarded as regulators of the amount of blood flowing to the tissues, their function being to draw upon the potential energy furnished by the arterial pressure. They do not contract simultaneously over the whole body and even if there is the constriction of a large group of arterioles, as occurs during a chill, the blood pressure may not be raised and may even be below its previous level. (Capillary Blood Flow in Man During Fever—read by Frank Fremont-Smith, et al., at the annual meeting of the American Society for Clinical Investigation, 1929.) With these facts in mind, it is permissible to assume that an increased tonicity of the arteries lying between the heart and the arterioles is the probable cause of the sustained increase of both the systolic and diastolic pressures; in other words, that the disease, essential hypertension, is brought about in this way. Essential hypertension may be described as a disease due to an unknown functional disorder, characterized by a progressively increasing elevation of both systolic and diastolic blood pressures; through the mechanical strain imposed by the high arterial tension, secondary changes are brought about in the heart and in the arteries, especially the coronary vessels and the

arterioles of the brain and in the kidneys, which frequently bring about a fatal termination. The disturbed function would appear to lie in an increased tonicity of the arteries and not in the arterioles. An example of this sort may be noted in table 11.

TABLE 11—AN EXAMPLE OF ESSENTIAL HYPERTENSION IN A MAN, AGED 40, IN 1920

Date	Blood Pressure		Date	Blood Pressure	
1919	Syst.	Diast.	1924	Syst.	Diast.
Nov. 8..	158	110	Apr. 9...	158	124
1920			June 6...	176	118
June 6...	146	98	Nov. 10..	182	120
Dec. 3....	150	110	1925		
1921			Apr. 6...	188	132
Mar. 25..	154	106	Aug. 10..	194	130
Sept. 27.	156	119	Dec. 23..	198	146
Dec. 10..	170	120	1926		
1922			Jan. 9...	203	154
Feb. 27..	158	106	Mar. 8...	202	134
Sept. 29..	178	130	Nov. 3...	196	128
Dec. 16..	165	124	1927		
1923			Jan. 13..	204	148
Feb. 15..	171	129	July 18..	185	144
Sept. 4..	168	117	Sept. 21..	210	150
Dec. 8...	151	126	Nov. 11..	178	123

The distinguishing features are a high systolic as well as a high diastolic pressure and a constantly rising blood pressure until it reaches levels at which the secondary changes attending essential hypertension are prone to become manifest. (Mosenthal.)[9]

At times a peripheral vaso-constriction may be superimposed upon an already existing hypertension and in this way an inordinate rise of blood pressure may be produced. Such an increment in blood pressure is usually very sharp and unexpected. Sometimes it lasts for a short time only; at others, it may be more prolonged. The instance given in table 12 in which a boy of 12

TABLE 12—BOY, AGED 12

	Blood Pressure		Blood Urea N	Remarks
1920	Sys.	Diast.	mg. per 100 cc.	
March				Pneumonia, mastoid operation, followed by albuminuria and edema.
1922				
Mar. ...	112	84	9.0	
1923				
Jan.	114	82	15.0	
Feb.	146	110	...	
1924				
Jan.	139	112	18.0	
Apr. ...	188	152	20.0	
Apr. ...	250	210	...	
Apr. ...	212	154	33.0	
May ...	202	162	28.0	Kidney decapsulation.
May	218	164	32.0	Died.

A sharp rise of blood pressure for no apparent reason in a case of chronic nephritis; presumably, there was marked peripheral constriction especially of the cerebral arterioles as there were repeated general convulsions to which the patient finally succumbed; the very high diastolic pressure is worth noting.

exhibited a sudden enormous rise, especially in the diastolic pressure, which attained the scarcely believable level of 210, is a very instructive example of this sort. In this case the peripheral vaso-constriction persisted and apparently was the cause of death through successive convulsive seizures brought on by cerebral anemia. A somewhat similar case, and one that has been very carefully worked up, is that of Oppenheimer and Fishberg.[10] In their patient the convulsions and rise of blood pressure were repeated at longer intervals and did not cause death; in this instance evidently the peripheral vaso-constriction was of an intermittent type and consequently was not fatal, as in the boy recorded in the table above.

Finally, there are some cases, which are rather uncommon, that have a comparatively low systolic pressure where the diastolic pressure is high. This is an indication of myocardial insufficiency and should be regarded as a danger signal of a failing heart. It is especially in older people that this phenomenon has to be watched for.

If we recognize that in all the various hypertensive states classified and enumerated above there is only one, that is essential hypertension, that is of serious importance, it may be worth while to consider this particular form of increased blood pressure a little further. As previously stated, essential hypertension may be considered a form of increased blood pressure brought on by an increased tonicity of the arteries and characterized by a rise in both systolic and diastolic pressure, which may bring about a fatal termination through the effect of the elevated arterial tension has upon the heart and the arterioles of the brain or kidneys. A possible classification of the forms which essential hypertension may assume are given in table 13.

TABLE 13—CLASSIFICATION OF ESSENTIAL HYPERTENSION

(A) Anatomical Classification, According to Secondary Lesions:
1—Cardiac,
2—Cerebral Arteriosclerosis,
3—Renal Arteriosclerosis.

(B) Classification According to Height of the Diastolic Pressure and Severity of the Secondary Lesions Irrespective of Organ Involved:
1—Mild (Benign) Hypertension,
2—Severe (Malignant) Hypertension.

The various lesions and their frequency entailed by hypertension are briefly expressed in table 14. The importance of hypertension as a cause of death has probably been underestimated thus far. Fahr[11] has recently calculated that about 25 per cent. of all deaths in persons 50 years of age or older are due to hypertension. It is desired to call attenion to the fact that approximately 60 per cent. of these cases succumb to cardiac disease; if this fact is borne in mind, prophylactic measures to forestall myocardial insufficiency may often prolong life for a considerable period.

TABLE 14—RESULTS OF PROLONGED ELEVATION OF BLOOD PRESSURE

Lesions Resulting from a Persistent Hypertension	Cause of Death	Approximate Pct. of Deaths in Hypertensives
Heart		
Hypertrophy	Myocardial insufficiency	
Dilatation		
Coronary Arteries		
Arteriosclerosis	Angina pectoris, Myocardial insufficiency	60
Myocardial degeneration		
Brain		
Arteriosclerosis	Cerebral haemorrhage, Encephalomalacia	20
Arteriolosclerosis		
Kidney		
Arteriosclerosis	Renal insufficiency	10
Arteriolosclerosis	Uraemia	

A prolonged elevation of blood pressure, especially diastolic pressure, results in arterial degenerations throughout the body and in cardiac insufficiency; some of these secondary lesions apparently never become serious, while others assume such proportions as to be a common cause of death; the above table presents the salient facts; whenever hypertension exists these changes are inaugurated, how rapidly and in which organs they progress depends upon the inherent quality of the individual tissues, as well as the degree of blood pressure elevation, especially the diastolic pressure.

Finally, a word may be said in regard to the classification of essential hypertension according to the severity and character of the secondary lesions. Cases of essential hypertension have been divided into "benign" and "malignant" categories on at least three different bases. At least two attempts have been made to differentiate hypertensive conditions as "benign" or "malignant" according to the lesions engendered in the kidney. Very recently Keith, Wagener and Kernohan[12] have again called attention to what they describe as a "malignant" form of hypertension. They describe this as a clinical state characterized largely by a typical retinitis associated with marked hypertension and adequate renal function. Reading between the lines of their article, it seems to me that they would agree in concluding that it is logical to classify essential hypertension as mild and progressive, or severe. The terms "benign" and "malignant" are for obvious reasons a little forced in this connection. It is logical to classify all cases of essential hypertension either as mild or severe, whether the termination is through cardiac, cerebral or renal disease. Every patient with a diastolic blood pressure persisting at a level of 130 or higher should be regarded as an example of severe essential hypertension and the prognosis considered to be exceedingly grave.

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DISCUSSION OF PAPERS ON HYPERTENSION AND NEPHRITIS

Dr. Charles A. Elliott, Chicago: At this time we little realize that the taking of blood pressure is a relatively modern achievement in clinical medicine. Gartner about 1902 developed the first instrument that was clinically applicable. Its use was restricted to a few clinical centers for a good many years. As a matter of fact, our whole idea as to the value of estimating blood pressure in clinical medicine has developed in the past twenty years. During this time our interest has been centered on the clinical interpretation of hypertension. We are just beginning to realize that hypotension is almost, if indeed not as important, as hypertension and has very important clinical bearings on many abnormal processes.

I must confess that I am much confused as to the interpretation of phenomena produced by both

hypertension and hypotension and also confused as to a rational plan of treatment of these conditions. Very little progress has been made in the treatment of hypertensive states in spite of the great amount of work that has been done in this field.

The observations on the effect of salt metabolism in hypertension persist in attracting our attention. Allen, as you know, has championed the beneficial effect of limiting salt in the treatment of hypertension, and in the literature you will find men who repeatedly bring out the question as to the effect of sodium chlorid on hypertension.

I think our lesson from this should be that hypertension is probably affected by some, as yet little understood, chemical reactions, some of them probably induced specifically by salt.

I am interested in hearing Doctor Mosenthal mention the association of duodenal ulcer and hypertension. The depletion of the chlorides of the blood is known to be effective in reducing hypertension in a few cases of hypertension associated with pyloric obstruction in which patients by vomiting reduce the supply of chlorides from the body.

Such a case recently observed in our work was a woman who had been for many years under observation with hypertension and who had a known peptic ulcer at the pylorus. She finally developed complete pyloric obstruction with vomiting of quantities of highly acid gastric secretion. Hypotension resulted and continued for a long period of time, her clinical condition being maintained otherwise fairly normal by rectal feedings. In her case hypertension became reestablished following a gastro-enterostomy. Therefore, salt, representing one of the features of a general chemical change in the body probably has something to do with the determination of hypertension.

The very interesting work that Dr. Kendall has presented to you this morning is another evidence of the chemical background that is associated with hypotension.

I was much interested in Doctor Mosenthal's careful clinical analysis of the whole problem. It is to be remarked, however, that classifications after all represent our present knowledge of a disease. We see clinical variations and our tendency is to classify them into different groups, often confusing rather than clarifying the problem.

I believe a real clarification of this problem will not come until we know the true etiology—not only the effects of pressure substances, but also those which produce hypotension, and until that time comes our mind probably will not be clear either as to the etiology or as to the treatment in these variations from the normal blood pressure levels.

Dr. R. O. Stites, Industry: I was certainly very much interested in the talks by these two very learned men, who tell us about hypertension and hypotension. The only benefit we can get out of our scientific meetings is what will be passed on to the general practitioner and to the public. As the doctor very well said hypertension apparatus has only been in use about twenty years, and it is undecided what benefits come from it.

Dr. Mosenthal in his paper showed what harm can be done by the general public knowing what is supposed to be normal and what is abnormal, because his figures show, we do not know any definite figure for all people. It is unfortunate that at county fairs, at schools and at universities people can go into a place and very hurriedly have a blood pressure taken, and have written on a piece of paper their exact status as to their health, from a blood pressure standpoint and take the reading with them to worry about. Personally I think that sort of thing does harm. Organized medicine and all practitioners ought not take part in any such thing, but should use their efforts to have it discontinued as a menace to the welfare of the people.

Dr. L. H. Sloan, Chicago and Aurora: One of the valuable things which has come out of the study of hypertension has been the decreasing frequency with which we make the diagnosis of uremia and the increasing frequency with which comas are diagnosed as being due to other conditions besides uremia.

If we will bear in mind that the diagnosis of uremia is a relatively rare diagnosis and that the examination of the blood content, as well as the examination of the urine, is of importance in the diagnosis of uremia, we will have learned something from the study of hypertension.

Those cases which Dr. Mosenthal brought out as being cases of intermittent vaso-constriction with hypertension coming on suddenly correspond probably to the cases which are being written up in the literature now as paroxysmal hypertension, which may occur in various types of renal conditions and other vascular conditions. Those are the types of cases which the older practitioner has well known respond promptly to vasodilators and to bleeding, whereas, the persistent type of hypertension, unassociated with that intermittent variability, rarely responds to even continuous administration of vasodilators.

One point about the variation in pressure: Of course, Draper has brought out the constitutional variation of many things, but it struck me that when a patient twenty years of age has a systolic pressure of 167, we are stepping up pretty high on the limits of possibility. It corresponds to a patient who might be seven feet and a half tall—we would not call him normal, exactly—so that to say that a patient who has a blood pressure of 167 systolic, and a high diastolic incidentally, is perfectly normal, seems to me to be stretching the question quite a bit. True, it seems obvious from the study of large statistics that there are patients who have high blood pressure at relatively young ages who are perfectly normal, a fact which has not been appreciated so much before.

In the prognosis of hypertensive states, also, one ought to say a word as to further studies in connection with other features which may give prognostic

import. As for example, electrocardiographic tracings as to the myocardial efficiency of the particular patient, ophthalmoscopic findings, etc.

I was glad to note that both Dr. Mosenthal and Dr. Munson brought out the fact that the diastolic pressure is, after all, the important pressure, for the myocardial changes and the cerebral changes and the renal changes in the vast majority of instances go along, hand in hand with the persistency of the hyperdiastolic pressure, rather than with the elevation of the systolic pressure, and if you will notice, his third group, with a relatively low systolic, but with a very high diastolic, was the group that gave much myocardial disturbance.

Some of us have believed that the accentuation of an aortic second tone persists over a longer period of time than we give it credit for, and that a patient who exhibits a prolonged and accentuated aortic second tone very definitely accentuated, even in the presence of his low blood pressure, is apt to be a person who has previously had a hypertension which for some reason or another is now at the particular time down.

One thing else that perhaps should be brought out, and that is that there is no reason why we should not all learn to use ophthalmoscopic examination—more frequently than we do, and to examine eye-grounds, or learn to examine them, just as much as we take blood pressure.

Dr. Kendall's work exhibits something rare—that is to say, the close cooperation between the laboratory worker and the clinician with the development of something of value as a result of the work of a broad-minded laboratory worker.

Dr. Angelo S. Geraci, Chicago: In reference to the question the doctor just asked, in this crude preliminary effort no attempt was made to draw any conclusion from this. We do not attempt to state whether that was due to the administration of sodium bicarbonate or not.

LEAD POISONING; WITH AN ANALYSIS OF EMPLOYEES OF AN ENAMELING PLANT*

WARREN PEARCE, M. D., and R. A. HARRIS, M. D.
QUINCY, ILL.

Several cases of lead poisoning were seen by the writer (W. P.) within a rather short period of time—all the cases being employed in one enameling plant. It was thought that an examination of the employees of this plant, especially with the view of determining potential lead poisoning cases, might be of interest. The purpose of this paper, therefore, is to review briefly the subject of lead poisoning and to present the results of this investigation.

There are few, if any, diseases that have the large number of contacts with all branches of our profession as has the one under discussion. It is of interest to the specialist in industrial diseases because of the great hazard it presents in over one hundred and fifty industries. It is of interest to the surgeon—principally on account of diagnostic problems it presents and to the general practitioner because of the possibility of its occurrence in the ordinary routine of daily life—even in the home. The neuritides and encephalopathies intrigue the neurologist. There have been a large enough number of cases reported in children to enlist the interest of the pediatrician, and the blood changes, kidney involvement and many other features are of interest to those in general medicine.

Hoffman[1] states that there has been a decline of from forty to fifty per cent. in the death rate from lead poisoning in the last decade. While lead poisoning in fatal form does still occur—chiefly in the painting trades, there undoubtedly has been a marked decrease. We are concerned, however, with morbidity as well as mortality and there is still much loss of time of workmen. Moreover, it is difficult to determine the actual number of cases, due to the lack of uniformity of state laws. In states where lead poisoning is compensable there doubtless is a tendency toward a larger number of cases. Again the differentiation between lead absorption and lead poisoning and the question as to whether state laws contemplate compensation for absorption cases further confuses the question.

Neiswander and Hayhurst[2] state that for the two and one-half year period ending December 31, 1927, there were reported to the Ohio State Department of Health a total of four hundred and fifty or a yearly average of one hundred and eighty—as compared to a yearly average of eighty-eight for the preceding five years. An increase of one hundred and three per cent. It would thus appear that while fatal cases have decreased in number, the non-fatal cases have increased in Ohio.

Of the cases reported in Ohio (last report),[3] twenty-one were in the enameling industry and seven of these were in women.

It has been stated that women are more sus-

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ceptible to lead poisoning than men.[4] Alice Hamilton[5] states that in the pottery and allied industries in the United States, the incidence is one to seven among women as contrasted to one to twelve or thirteen in men. The number of cases reported in women would necessarily be smaller than that reported in men, as fewer women than men are employed. It is probably true, however, that women develop lead poisoning following shorter exposure than do men.

Charles McKhann[6] finds that lead poisoning is of relatively frequent occurrence in children and has usually been associated with pica or perverted appetite.

The clinical picture of lead poisoning is a varying one. Many persons exposed to lead poisoning have constipation and other mild gastro-intestinal symptoms. It is probable that many of these persons upon careful examination would show lead absorption as disclosed by some stippling of erythrocytes and lead in the urine. Such cases cannot be properly labeled lead poioning yet they occupy a stage where prophylactic treatment is of great importance.

The onset of symptoms of lead poisoning is signalized, with greatest frequency, by abdominal pain, lead colic. The pain is general but most pronounced in the umbilical region. An explanation that has been offered for this pain is that it is due to irritation of the ending of the vagus fibres, giving rise to a spasm of the intestinal muscles. Constipation is always present and vomiting, eructations aad other digestive manifestations are frequent concomitant symptoms.

Marked lead palsies are not frequent in cases diagnosed early and removed from the influence of lead. A slight sense of weakness in wrists, ankles and shoulders is frequently present. The typical palsy when present affects most commonly the peronei and extensors of the toe and the extensors of fingers and wrists.

Encephalopathies are not of frequent occurrence but are of bad prognostic significance. There were several extreme cases of very rapid development in the tetra-ethyl lead industry. Cardiovascular involvement, hypertension and arterio-sclerosis are frequently present in old lead workers.

The kidney may be involved both by toxic destruction of epithelium of the tubules with symptoms of nephrosis, and as a glomerular nephritis with hypertension and nitrogen retention.

In the diagnosis of lead poisoning the clinical picture and laboratory examination are both of great importance. In a patient with constipapation and abdominal pain who is known to be exposed to lead, intoxication from lead should always be suspected and ruled out. If there is present a lead line on the gums and stippling of the erythrocytes, lead in the urine and a slow hard pulse, the evidence is conclusive. It is the slow hard pulse that is of greatest importance in the differentiation between lead poisoning and acute appendicitis, ruptured duodenal or gastric ulcer and other acute abdominal conditions. The occurrence of other diseases with lead poisoning may create a difficulty in the proper evaluation of the symptoms and management of the case as the following case will illustrate:

W. D., female, age twenty-three years. Has been married. No children.

Occupation: Sprayer in an enameling plant.

Family History: No facts of importance.

Previous Illness: Had "dropsy" at age of ten. Denies venereal disease.

Present Illness: For past two weeks has had cramps in abdomen and marked constipation, some pain in long bones, and moderate weakness in wrists. Vomited several times at onset of symptoms and occasionally since. The abdominal cramps became much worse today.

Examination:

General: Well-nourished young adult, female. In bed—evidently in pain. The breath has a foul odor. Temperature, 99; pulse, 80; respiration, 20. Blood pressure, systolic 116, diastolic, 61. No skin lesions.

Head and Neck: Some coagulated blood in nose. Patient states that she has always had some trouble breathing through nose and has not worn her respirator regularly. There is turgescent rhinitis. Tongue fairly moist but thickly furred. There is a dark bluish line along gum margins, a typical lead line. Tonsils normal. Pyorrhea. Some caries of teeth. Thyroid not enlarged.

Chest: Heart. There is a faint systolic murmur heard over base. Area of cardiac dullness normal.

Abdomen: No localized tenderness. Moderate rigidity of muscles. Spleen not palpable. Area of liver dullness not increased.

Nervous System: Pupillary, tendon and superficial reflexes normal. No Babinski, Gordon or Oppenhein. No Romberg.

Muscular Power: There is a slightly diminished ability to extend hands and a slightly decreased ability to extend feet.

Blood: Hemoglobin, 65%; erythrocytes, 3,580,000;

leucocytes, 14,700; polymorphonuclear leucocytes, 80%; lymphocytes, 20%. Stippled erythrocytes present in moderate number. Moderate polychromatophilia and achromia. Blood Wassermann four plus. Two antigens.

Urine: No albumin or sugar, numerous pus cells with some clumping; epithelial cells; occasional hyaline and granular casts; lead positive.

In such a case it is necessary to treat the lead poisoning before beginning anti-luetic treatment —because the kidneys show some effects of the lead.

There is not a complete unanimity regarding the evaluation of the blood findings in lead poisoning. B. Kogan and L. Smurnowa[7] state that the appearance of basophilic granules must be regarded as practically specific for workmen in the lead industries. Ehrlich, Grawitz[8] and others maintain that basophilia is diagnostic of plumbism, anything over one hundred basophiles per one million red corpuscles being regarded as absolute proof of lead poisoning. L. I. Harris[9] in one hundred and three active cases noted absence of basophilia in eighty-eight per cent. G. M. Kober and W. C. Hanson[10] report that in fifty per cent. of a large number of cases of plumbism at Massachusetts General Hospital, basophilic granules were absent. Kjer[11] believes that in cases showing one thousand cells with basophilic granulation per million erythrocytes, there is danger of intoxication and that subjective symptoms do not usually develop until this limit is reached.

McCord, Minster and Rehm[12] devised a method by which the basophilic material is clumped in the red cell—the so-called basophilic aggregation test. This is accomplished by causing hemolysis of the red cell prior to staining. The stain used is Manson's methylene blue. The stain is diluted with distilled water until it is transparent and the unfixed slide is stained for ten minutes. With this slow staining, hemolysis occurs before staining. It is this method that we have employed.

Anemia is usually present in lead poisoning but it most often is of moderate degree. In one hundred and fifty cases of undoubted lead poisoning reported by Seitz,[13] only twenty-three and nine-tenths per cent. presented a hemoglobin (Sahli) below sixty-four.

There is likewise a lack of complete accord as to the value of lead in urine in suspected cases. Lt. Comdr. Brown[14] reports that of twenty-six cases of active plumbism, lead was found in the urine in all save one. Norman Gwyn[15] states that the examination of the urine for lead must remain as the final determining proof of lead absorption. In marked contrast is the conclusion of Kehoe[16] and others that there is no diagnostic value in qualitative lead determinations in the excreta of persons suspected of having lead poisoning.

The lead line on the gums when present is of great value in diagnosis but often is not present in the positive cases, being found usually in cases presenting pyorrhea. Fetor ex ore has no definite value in diagnosis of plumbism. It is, as has been said, an indication of a neglected mouth —rather than of lead poisoning.

While weakness of the extensors of wrist and ankle are not infrequently concomitants of lead poisoning, typical wrist and foot drop are not found as commonly as formerly, due, we believe, to the earlier diagnosis.

Cerebral manifestations of lead intoxication are not common. It is said that the severe central nervous system symptoms are more commonly found in negroes and women.

The scope of this paper does not contemplate a recital of all the causes of lead poisoning; but, in addition, to the one hundred and fifty industries in which it has occurred, a large number of non-industrial conditions have operated in its causation. Worthy of mention, however, is the study of Wright[17] and others of one hundred and two lead conducted water supplies. These investigators found that all the water of such supplies contained lead. Two hundred and fifty-three persons exposed to this water were studied and sixty-three or 24.9 per cent. were poisoned. It also is considered timely to refer to the case reported by Knowlton[18] caused by siphoning wine—the hose used being shown to contain lead; and the case reported by Vaughn[19] from drinking "moonshine" whisky. Numerous cases have also been reported from the use of snuff[20]. Many cases have been reported in infants and children—caused by lead nipple shields[21], lead toys and pica.[22]

The industries, however, furnish the larger number of cases, and it is with a view to possible assistance in this problem that this study of an enameling plant is presented.

The plant whose employees were examined is

an enameling plant devoted to the enameling of stove parts. All of the employees, numbering thirty-six, were examined, of whom three were office workers. The enamel used—so we are informed by the manufacturers[23]—has the lead added as the oxide PbO or Pb_3O_4 or as the carbonate $2\ PbCo_3Pb\ (OH)_2$ and the compounds formed are lead boro-silicates. Prior to spraying, the metal is subjected to a so-called pickling process in which it is treated successively with sulphuric acid solution, soda ash solution and mild borax solution. The enamel is sprayed on the metal by means of spray guns with an air pressure of about fifty pounds at the nozzle. The sprayers are in booths, having individual DeVilbiss exhaust fans and each sprayer is furnished with a Cover respirator with instructions to wear it at all times while spraying. For the most part this instruction is complied with. All employees were familiar with the fact that a lead hazard was present. Most of them professed to washing their hands thoroughly with soap before eating. The number of baths taken weekly varied from one to seven.

Each employee was given a general physical examination and was carefully questioned to elicit symptoms of lead poisoning. The laboratory work consisted of a hemoglobin determination (Dare) and erythrocyte count, a routine chemical and microscopical examination of the urine and an examination of blood to determine the number of basophilic aggregations. Basophilic material, it will be remembered, is a characteristic, the most uniform one, of young erythrocytes. An increase of basophilic aggregations will be found, therefore, in severe anemias. An increase is found also in benzol and arsenic poisoning, and there may be a slight increase following exposure to ultra violet rays or x-rays, and slight increases have been observed in pregnancy and some other physiologic conditions. We feel that it has been well proved that the qualitative demonstration of lead in feces and urine is not of diagnostic value in determining lead poisoning and these tests were not made. The method of recording basophilic aggregations described by McCord and others was used. One plus indicates few cells containing basophilic aggregations on entire slide. Two plus, an average of one basophilic aggregation in every field. Four plus, four basophilic aggregations in approximately every field. Six plus, six basophilic aggregations in approximately every field. Ten plus, ten or more basophilic aggregations in every field. It was concluded by the above investigators that two plus is the upper limit for normal persons. If the result is four plus or more it was considered suggestion of lead poisoning and treatment was instituted if the result was six plus or more. All of their cases of definite lead poisoning showed a basophilic aggregation of ten plus or more with the exception of three cases.

Since the original report of McCord and others, the value of the basophilic aggregation test has been further demonstrated by an examination of one thousand and forty-five persons, the results of which are embodied in Bulletin No. 460 of the U. S. Bureau of Labor Statistics.

Of the thirty-six employees examined by us, thirteen had a basophilic aggregation test of plus ten. Eight had plus six. Nine had plus four. Three had plus three. Two had plus two. And one had no basophilic aggregation. It is interesting to note that the only employee showing no basophilic aggregation had been employed at this plant one week only. Thirteen cases showed anemia—most of these, however, were slight. One case (No. 10) had a hemoglobin (Dare) of forty-nine per cent. This case gave an interesting history. She began work in this plant in October, 1928; after eleven weeks of work, she stopped on account of illness; her symptoms were general aching, nausea, colic, pallor, weakness and lead line. She was told that she had lead poisoning and had only returned to present employment two days before this examination. Sixteen cases had pyorrhea. Although thirteen of the employees examined were females, pyorrhea was present in only three of them.

In the course of the examination many defects were discovered. Two cases had diseased tonsils. Five had skin diseases, as follows: Two acne vulgaris, one psoriasis, one scabies and one pronounced ichthyosis. The latter case gave a history of meningitis at age of two and one-half years. One case presented clinical evidence of gall bladder disease and another a history of an attack diagnosed as cholecystitis. Two cases presented evidence of diseased hearts; one of these had blood pressure of systolic, 186 diastolic, 94

had cardiac hypertrophy; the other a systolic murmur at apex transmitted to left, with a slight cardiac hypertrophy. There was one case of hyperthyroidism, and three cases presented a glycosuria, while three cases presented pyuria. There was one case of almost complete deafness and one of moderate deafness. One case had no vision in right eye (due to accident in childhood) and another a deformity of left pupil from accident—with poor vision in left eye. One tumor of right inguinal region and one hernia were discovered. One patient, a girl, had evidence of operation of the left hand and marked atrophy of left breast and arm. She stated that a diagnosis of sarcoma had been made and operation was for that condition several years prior to our examination. She also stated that the atrophy followed X-ray treatment and there was ample evidence that she had received such treatment. This does not include all abnormalities discovered in this work, but is sufficient to demonstrate the large percentage of supposedly normal individuals that are abnormal and, further, such facts should impress upon the employer the great risks he assumes when he employs people without requiring a physical examination.

The results of our study are embodied in the following tables:

Table 1 is made up of the cases with basophilic aggregation of ten plus or higher. In several instances there were a very large number of aggregations.

Several interesting facts are disclosed by this table. The average length of employment of this group is four and eight-tenths years. Five disclosed a lead line on the gums—three had abnormal urines. Nine had anemia. The average age of the group was 35.14 years and the average blood pressure was systolic, 142, and diastolic, 82. There were four in which the blood pressure was definitely high. It will be noted that only three of the cases were employed as sprayers. This is of interest because all of the sprayers were females, save one, and it has been said that females are more susceptible to lead poisoning than males. Two factors must be considered in this connection, however—first, the protection afforded the sprayers in this plant is excellent; and second, the average time of employment of the female sprayer group examined is about four months. The single male sprayer had been employed six years. He gave a history of previous lead poisoning and at our examination showed basophilic aggregation greatly in excess of plus ten. Four cases in this table presented constipation. This table discloses the fact that in this plant, length of time employed was of greater importance than the type of employment, in so far as evidence of lead absorption is concerned.

Table 2 (page 418) comprises the cases with a basophilic aggregation test of plus six.

The average time of employment in this group is 1.87 years. The average age of employees is 29.8 years and the average blood pressure of the group is systolic, 129; diastolic, 78. Case 19, found in this group, gave a history of lead poisoning one year ago, and at our examination had headache and presented a suggestion of a lead line—the only one in this group. One case in this group disclosed a moderate anemia. Four of the group are burners or burners' helpers.

TABLE 1.

No.	Sex	Age	Occupation	Time Employed—Years	Lead Line	Pyorrhoea	Anemia	Urine	Blood Pressure	General Symptoms
4	F	18	Sprayer	0.5	0	0	Slight	hy. & gr. cast—tr. albumin	124/86	Slight constipation—headache.
7	F	21	Brusher	6.5	0	0	Slight	Negative	130/70	None.
13	M	30	Sprayer	6.0	Sl.	0	Slight	Negative	140/80	Patellars sluggish—headache—pain in left shoulder.
15	M	64	Sorter	5.0	Sl.	Yes	Mod.	hy. cast f. tr. albumin	186/94	C. V. R. disease—emphysema.
16	M	62	Mill operator	6.0	Yes	Yes	Mod.	Negative	142/76	Weakness legs—slight colic—dizziness—headache—tremor—dyspnoea.
18	M	16	Trucker	0.5	Sl.	Sl.	Slight	Negative	116/72	Acne—spongy tonsils.
20	M	38	Burner	5.0	Sl.	Sl.	0	Negative	124/86	Acne—headache.
22	M	25	Burner	5.0	0	0	Mod.	Negative	134/86	History of cholecystitis.
25	M	33	Laborer	4.0	0	Yes	0	Negative	132/74	None.
26	M	45	Burners' Helper	5.0	0	Yes	0	Negative	154/80	Sys. murmur at apex—Cardiac hypertrophy.
27	M	26	Burner	6.0	0	0	Sl.	Negative	174/78	Tremor—tachycardia—Enlarged thyroid.
32	F	39	Office Manager	5.0	0	0	0	Negative	130/84	Unoperated appendicitis one year ago.
36	M	40	Foreman Sprayer	8.0	0	0	Mod.	Casts	162/106	Rheumatic fever three years ago.
AVERAGE 35.14				4.8					142/82	

TABLE 2

No.	Sex	Age	Occupation	Time Employed—Years	Lead Line	Pyorrhoea	Anemia	Urine	Blood Pressure	General Symptoms
2	F	18	Sprayer	0.5	0	0	Mod.	Trace sugar	116/64	None.
8	F	20	Brusher	3.0	0	0	0	Negative	130/70	Headache—menses normal—no pain.
14	M	27	Shipping clerk	6.5	0	0	0	Negative	140/78	Faint systolic murmur at base—no enlargement.
19	M	39	Burner	3.0	Sl.	Sl.	0	Negative	124/86	Lead poisoning one year ago—headache.
21	M	49	Burners' Helper	0.67	0	Sl.	0	Many leucocytes	132/82	Dyspnoea—pain in knee and in gall bladder—tonsillitis.
23	M	27	Burners' Helper	0.4	0	Sl.	0	Negative	136/78	None.
28	M	27	Burners' Helper	0.75	0	0	0	Negative	126/84	None.
29	M	32	Pickler	0.1	0	0	0	Negative	132/82	Pain in knee from previous rheumatism.
AVERAGE 29.8				1.87					129/78	

Table 3 consists of those cases in which the aggregations were plus four.

The average age of this group is 28.5 years; and the average length of employment is 2.6 years. The average blood pressure of the group is systolic, 126; diastolic, 80. There was one lead line in this group, in a mill operator, who had been employed two years. His blood pressure was systolic, 152; diastolic, 100. This case also had a moderate glycosuria.

TABLE 3

No.	Sex	Age	Occupation	Time Employed—Years	Lead Line	Pyorrhoea	Anemia	Urine	Blood Pressure	General Symptoms
6	F	19	Sprayer	0.46	0	0	0	Negative	130/80	Weakness — constipation — colic — menses normal.
9	F	16	Dryer	0.008	0	0	0	Negative	122/80	None—menses normal.
10	F	29	Sprayer	0.005	0	Sl.	Mod.	Tr. Sug.	116/80	Palpitation—menses normal.
11	M	40	Sand Blaster	3.0	0	0	0	Negative	102/64	Rare headache.
17	M	32	Mill Operator	2.0	Sl.	Yes	0	Sugar ++	152/100	None—states health excellent.
24	M	35	Inspector	5.0	0	Yes	Sl.	Negative	140/84	Pain in knee—ichthyosis.
30	M	35	General Utility	2.5	0	Sl.	0	Negative	134/84	Transient headache.
33	F	20	Stenographer	2.0	0	0	0	Negative	110/72	Tremor—pain in knee all life—headache—menses normal.
34	M	31	Manager	8.5	0	0	0	Negative	132/76	None.
AVERAGE 28.5				2.6					126/80	

Table 5 comprises control cases in which basophilic aggregation tests were made.

It is interesting to note that No. 7 of this group was undergoing treatment for lues at time of examination, an arsenical being used in the treatment. This was the only case showing ten plus. In numbers four, five and six, there was a question of lead exposure in occupation.

TABLE 4

No.	Sex	Age	Occupation	Time Employed—Years	Lead Line	Pyorrhoea	Anemia	Urine	Blood Pressure	General Symptoms	
12	F	34	Dryer	0.67	0	0	Slight	Negative	140/100	None	+++
31	M	39	Burner	2.5	0	Yes	0	Negative	126/74	Headache—asthenia	+++
35	M	33	Supt.	7.0	0	0	0	Negative	118/84	Headache—pain shoulder—numb. legs—swelling feet.	+++
1	F	23	Sprayer	0.43	0	Yes	0	Occas. hyal. cast	116/70	Symptoms suggestive of duodenal ulcer	++
3	F	19	Sprayer	0.83	0	0	0	Negative	80/50	None	++
5	F	17	Sprayer	0.02	0	Sl.	0	Negative	108/66	None	0
AVERAGE 27.5				2.9					115/74		

Table 4 comprises the cases showing aggregations of three plus and less.

The average age of this group was 27.5 years and the average length of employment was 2.9 years. The average blood pressure of the group

Comment: The employees of a small enameling plant were examined with the purpose of determining the number of basophilic aggregations

TABLE 5—CONTROLS

No.	Name	Sex	Age	Health	Occupation	Exposure	Basophilic Aggregation
1	F. B.	F	25	Good	Office work	None	+
2	M. C.	F	21	Good	Telephone Operator	None	+
3	R. H.	F	33	Good	Housewife	None	0
4	O. H.	M	25	Good	Welder	Yes	+++
5	R.	M	40	Gangrene lung recovery	Painter—one year ago	Yes	+++
6	C. R.	M	32	Good	Machinist (Storage Battery)	Yes	++++
7	M. M.	F	18	Lues.	Stenographer	Neoarsphenamin	++++++++++
8	A. W.	F	24	Follicular tonsillitis	Teacher	None	+
9	J. E. S.	M	35	Boils—G. C.	None	None	+
10	W. P.	M	44	Good	Physician	None	0
11	A. H.	F	24	Good	Office work	None	+++
12	O. F. B.	F	18	Good	None	None	+++
13	Sr. A.	F	50	Good	Lab. work	Possible	0
14	J. F.	F	20	Good	Nurse	None	++
15	G. L.	F	21	Good	Lab. work	Possible	+++
16	E. T.	F	20	Good	Nurse	None	0

in the blood and correllating the findings with symptoms of lead poisoning. Of the thirty-six examined, in only three did the basophilic aggregation count fall within the limits of normal as determined by McCord, Minster and Rehm. Twelve cases presented anemia, seven cases had a lead line, eight presented mild gastro-intestinal symptoms. Thirteen cases presented basophilic aggregations of ten plus or more and in this group were found nine of the twelve cases of anemia, five of the seven lead lines. While averages are often considered fallacious, it is nevertheless interesting to note that the average length of employment was far greater in the group of ten plus than in the other groups; and that the average blood pressure was greatest in this group, a finding consistent with the belief that employment in a lead industry causes a gradual rise of blood pressure.

Leathers and Morgan[24] conducted an examination in a plant, peculiarly like the one here studied. In that instance the plant was also devoted to the enameling of stove parts and the employees numbered thirty-nine. The results of the two studies were similar. They examined the blood for stippling but not for basophilic aggregations. They reported fifteen cases of "positive lead poisoning." Our group revealed thirteen with basophilic aggregations of plus ten or more —many of whom had other symptoms of lead poisoning. It appears to us, however, that several of the cases reported as "positive" by Leathers and Morgan are open to question, and we certainly would not record our group of thirteen as all positive lead poisoning. Both studies revealed a large number of other physical defects. Working conditions in the plant here studied were much better than those in which the Leathers and Morgan examination was made.

CONCLUSIONS

1. The basophilic aggregation test is a simple procedure that may be profitably employed in lead industries as a warning of increasing lead intoxication.

2. Lead poisoning is a hazard in industries where lead is used, even where working conditions are excellent.

3. Physical examinations should be made of employees at time of employment and at intervals thereafter.

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DISCUSSION

Dr. R. A. Harris, Quincy: This test really is extremely simple and the aggregations are much easier to find than the basophilic stippling. The stain consists of 5 grams of borax, 2 grams of methylene-blue, and 100 c. c. of boiling water. McCord says that for some reason certain batches of stain that he has made up do not work, and he believes it has something to do with the hydrogen ion concentration. However, the batches that we made up luckily were good. The smear may be made just as for an ordinary Wright's stain, except that it is preferable to get a fairly thick smear rather than a thin one.

McCord believes that he gets about three times as thick a smear as an ordinary Wright's stain smear. The red cells are usually layered and it is possible because of laking to see through several layers.

One may either lake the blood with saline or with distilled water before staining, or, much more simply, make up a fresh dilution of Manson's methylene blue with distilled water until it is transparent and then stain without fixing for ten minutes. With a very dilute stain such as this we get a laking before staining.

The appearance of the aggregations will vary with the rapidity of the laking so that sometimes we are able to find them in a sort of ring formation. At other times they seem to be extruded from the cells. Sometimes the cells will show up as rather pale bodies. At other times they will be absolutely invisible.

At first we found that many of our stains were washed off and it is advisable to make them fairly thick and to wash them very gently. The slides are examined after drying with the oil immersion lens.

Since we have gotten this list of controls I have taken a few others. One the other day was in an anemia following a terrific infection. This case had a hemoglobin of sixteen per cent. and a blood count of 1,580,000. Needless to say, she had a ten plus, and really higher than a ten plus, although this is as high as McCord goes.

I felt that the test was fairly valuable indication of basophilic material. You will find aggregations in many cases in large numbers where you do not find the stippled cells and with a great deal more ease. Dr. Pearce and I did our work as independently as possible. That is, I knew nothing of the time of employment or the specific nature of employment of any of the cases on which I took aggregations, and we only correlated our findings after the work had been done.

Dr. M. Earl Brennan, East St. Louis: I was very much interested in Dr. Pearce' paper. I have had experience with manufacturers of lead products for several years. His problem is only a drop in the bucket to what ours is in manufacturing the lead products that they use.

The plant at Quincy has many physically unfit employees judging from all the physical defects and abnormalities reported.

The blood smear for cell aggregations is worth every bit that he says it is. It should be done routinely, but I would like to emphasize that each plant has its own problem.

The difficulty with this type of statistics is that it does not take in all types of absorption. The findings both clinically and by laboratory depend upon two factors: the amount of lead absorbed and in what length of time that amount was absorbed. One man with a cell aggregation of ten may be reaching a dangerous point, where another employee with a cell aggregation of a greater number may not be so dangerous. It depends upon his particular occupation and the particular hazard connected with it and the time interval in the rate of increase in cell aggregations.

The number of cell aggregations mentioned as indicating reaching the danger line, I think, is too small. One large plant uses this routinely.

They alternate or change the men when the cell aggregation averages 30 or 40 per field, or when there are so many that you cannot count them, these men are kept away from any further lead absorption and given other employment in the plant, and may return when their cell aggregation gets below six. The rate of increase in cell aggregation is more important than the actual number per field except in extremes.

I would like to ask if he checked the number of cell aggregations against stipple cells, and the proportion found.

I do not see clearly any differentiation between lead posoning and lead absorption. We do not use the term poisoning. All our cases are classified as lead absorption or lead intoxication with four types under intoxication. Lead poisoning may mean anything from zero to the most severe cases. The cases that we call lead

(poisoning) intoxication are clinical cases with subjective symptoms that are ill and unable to work, disability cases. The others are classed as lead absorption. You have no lead hazard or no lead industry where the employees working will not in time show symptoms or signs of absorption.

The lead line is seen less frequently in women than in men because they take better care of their teeth and gums. The lead line will only be found in diseased gums. Some of our acute cases never show a lead line, and some of our most chronic absorbers over long periods of time show constant lead line, depending upon the care of the gums. The lead line is positive evidence of lead absorption but never indicates poisoning or intoxication. In known absorbers it should never be considered as a point in diagnosis.

The finding of lead in the urine or feces is of very little value except in non-industrial cases. There is no one working in any lead industry, absorbing lead, but what you may find lead in the feces or urine. It is of no value in making a differential diagnosis.

The blood pressure findings in the series presented I think are not really due to lead. In early acute intoxications you get no rising blood pressure. In fact, in most acute intoxications you get a fall. With men who have been in the lead industry for long periods of time with slow chronic absorption there are gradual changes, and they usually have a gradual rise in blood pressure.

I do not think females should be employed as sprayers in enameling plants. We have three enameling plants of the same character as mentioned, in our district.

Dr. Warren Pearce, Quincy: I am sorry that time did not permit the reading of the entire paper, because many of the points mentioned by Dr. Brennan are brought out in the portion of the paper that was not read.

As previously mentioned, I am not primarily interested in occupational diseases. I became interested in lead poisoning because several cases had been encountered in my practice, all of the cases coming from the plant here studied.

The doctor should read, if he has not already done so, the article by Leathers and Morgan to which I have referred in the paper. In the plant investigated by these authors, not a single employee was found free from physical defects. The number of physical defects found in our cases was mentioned as an argument for the physical examination of all workers before their employment. It is difficult to see how employers can afford to take the risk of employing workers without physical examination. However, they do assume this risk in many instances.

In this study, examination of the blood for stippling was not made as our interest was primarily in the basophilic aggregation test. Dr. Aub of Harvard, with whom I have corresponded on this subject, considers the basophilic aggregation test is an indication of active blood degeneration and is positive in lead poisoning as well as in other conditions causing such degeneration, and that it is a satisfactory test as a warning of developing anemia, whether it be from lead or other causes.

The lead line, as has been said, is found in cases of lead poisoning where the mouth and teeth have been neglected. When occurring it is of diagnostic value.

TREATMENT OF HYPEREMESIS GRAVIDARUM

EDWARD L. CORNELL, M. D.
CHICAGO

Nausea and vomiting in pregnancy are neglected by both the physician and the patient. The patient labors under the delusion that hyperemesis is essential in the early stage of pregnancy. The physician seldom has a clear cut idea of its management. Consequently, it is the patient who suffers. It is for this reason I wish to present a working basis for the management of these cases. This plan, if followed in its smallest details, will be successful in 90% of the cases.

To obtain the best results, one should see the patient early. First, make a complete physical examination and rule out other causes of vomiting, especially infections about the head. Nasal accumulations discharging backward, are not an infrequent source of vomiting. Abdominal disturbances, such as gall-bladder disease, chronic appendicitis and ulcers of the stomach and duodenum, have been factors in producing the nausea and vomiting in several patients. One should not overlook local disturbances such as retroversion of the uterus, cervicitis and vaginitis. If any of these are present, they should be treated as indicated. I have found it necessary, in the past ten years, to remove three appendices. Two patients have had their nasal infection treated by rhinologists; two have had abscessed teeth removed, and one patient had pyorrhea so badly that it was a factor in producing the nausea and vomiting.

If none of the above causes are present and we think the nausea and vomiting are due entirely to the pregnancy, it is my custom to give the patient the following printed instructions:

"Have a small quantity of soda crackers, social tea wafers or any biscuit beside the bed, also a thermos bottle containing hot coffee, hot or cold milk or hot tea, whichever is preferred. Prepare

these in the evening before retiring. Whenever you wake during the night eat two or three biscuits and drink a small cup of fluid. When you wake in the morning do the same and then rest quietly for at least an hour. Shortly after arising, eat your regular breakfast. Thereafter eat at least every two hours, oftener if the nausea returns. The taking of food, promptly, should relieve the nausea. Do not, under any circumstances, drink liquids of any kind without taking solid food. With the exception of highly seasoned, fat fried or indigestible foods, no restriction is placed on the variety of foods which may be taken. Popcorn will frequently alleviate the nausea. If these instructions do not prove successful in eliminating your unpleasantness in a few days, report at the office."

In addition to this I prescribe corpus luteum tablets, gr. 2, four times a day. If the patient is not sleeping well, luminal ½ gr. is given at 9:00 p. m. She is allowed to stay home for about a week. If the nausea and vomiting become worse, she is hospitalized early. Do not wait, because it is more difficult to control a late case. It is almost useless to treat this type of patient in the home. I have long since given up trying. There are too many interruptions in the routine, too many household details to watch, too many telephone calls, too many doorbells ringing and too many thoughtless friends who harp on the patient's illness. In the busy home today this is more than this pregnant patient can overcome.

With the patient in the hospital, it is here that some definite plan should be utilized to obtain the best results. Many plans have been suggested, but I find that most of them lack detailed instruction. Therefore, unless one is trained in obstetrics, the methods are frequently misapplied. I know this to be true from my consultation work in this field.

I wish now to present a definite routine which can be utilized in the management of the majority of cases. During the first 24 hours in the hospital the patient is given no food by mouth. The room is darkened and a special nurse is employed. Care should be taken in the choice of nurse, one who has had experience in the handling of hyperemesis gravidarum, being necessary. It is essential that she be quiet in her manner and be confident in obtaining results. The telephone should be disconnected and visitors prohibited. The only relative given permission to visit the patient is the husband, unless it is found that his presence excites the patient and produces nausea and vomiting. This fact is frequently overlooked by the nurse and physician.

The average patient with nausea and vomiting is suffering more or less from acidosis and the object of our treatment, therefore, should be to overcome this. After the patient has been in the hospital for a few hours, a cleansing enema is given and proctoclysis started. We endeavor to have her retain 4000 c.c. of the following solution every 24 hours:

Glucose	5%
Soda bicarb	2%
Sod. Brom	gr. 160
Water	4000 c.c.

The fluid is given by the Murphy Drip Method and is usually retained without a great deal of difficulty during the first 48 hours. One ampule of Corpus Luteum is given (hypodermically) three times a day. An alkaline mouth wash is prescribed, the one most frequently used being Liq. Antisepticus Alkalinus. The teeth and tongue are cleaned three or four times a day with this solution. This is essential, as a bad taste in the mouth is not an infrequent cause of nausea.

If the patient has been sick for some time before entering the hospital, I frequently use gastric lavage on the first day. Six or eight quarts of tap water are employed. About 500 c.c. of ½% soda bicarbonate solution is left in the stomach. I find that this produces gastric rest and gives the patient a sense of well-being.

The nurse is instructed to save each specimen of urine, recording the time passed and the amount. Each one is tested for acetone and diacetic acid. It is important to know whether or not there is much of these products present in the urine since the management of the case depends a great deal upon the presence or absence of these signs of acidosis. The gradual or rapid decline in the amount of diacetic acid or acetone means the patient is recovering.

The second 24 hours the patient is given toast, jelly, iced hard boiled egg and jello. It is essential to have the food attractively served. The patient is encouraged to eat every 2 hours at least, more frequently if the nausea is present.

The corpus luteum is continued. If the patient seems to be dehydrated, 2000 c.c. of salt solution is given by hypodermoclysis. If the acetone and diacetic acid are present in large quantities, 5% glucose is used instead of normal salt solution.

The third day, if the patient is doing nicely, she is given a dram of liquid by mouth every ten minutes which amounts to nearly a pint in 16 hours. The patient is requested to note the time and feed herself the liquid. We do this for two reasons: to keep her busy and to occupy her mind. The food allowance is increased to include a baked potato, a lamb chop broiled so that the edges are slightly burned and a warm cereal, using butter and sugar instead of cream. Hard candies are served as the patient desires. The corpus luteum is decreased to 2 ampules a day. The proctoclysis is reduced to 2000 c.c. per day.

On the fourth day we increase the water intake by mouth to 3 drams every fifteen minutes and give a glass of liquid with the meals. The same diet is continued as on the third day.

On the fifth day the patient is allowed to select food from the regular diet. Liquids are given more freely and the proctoclysis is stopped. Usually by the sixth day, she is up in a chair and home on the eighth or tenth day. It is essential that the patient be protected from visitors and petty annoyances until she is well enough to sit up.

If the patient does not show results with this management by the third day and if the diacetic acid and acetone still remain high, I have on several occasions used glucose and insulin. In a few cases it has worked marvelously while in others it has had apparently little effect, in which instances I am inclined to believe that we have waited too long before employing them. On the other hand, they should not be used too early.

Other methods of procedure are recommended, the best perhaps being the use of the duodenal tube in stubborn cases. The tube is passed and liquid preparations, such as peptonized milk, etc., are used. I have had no occasion to employ this method in any cases under my personal direction.

The patient should not be allowed to go on indefinitely with nausea and vomiting before a therapeutic abortion is done. One should not endeavor to see how much the patient can suffer before we interfere. The least sign of a neurotic lesion, of a persistent tachycardia or a rapid loss of weight in spite of treatment, is an indication for the interruption of pregnancy. The method of procedure should be individualized. Personally, I prefer curettage, gauze induction or vaginal cesarean section, depending upon the vitality of the patient and the period of pregnancy.

I have purposely left out references to many other procedures, preferring to leave this routine fresh in your minds. It has given good results in 90% of the cases under my personal direction and has proved practical in the hands of students and internes.

THE HEALTH WORK OF THE LEAGUE OF NATIONS*

A. R. E. WYANT, M.D.

CHICAGO

It was my privilege during the past summer to be a member of a select group of 100 professional men, under the leadership of Sherwood Eddy, to make a study of economic, political, social and religious conditions in Europe, listening to and interrogating leading men in London, Berlin, Prague, Vienna and Paris. At the headquarters of the League of Nations in Geneva, Switzerland, we were joined by another group of 150 from English speaking nations and there made a study of that great international organization.

I was the only physician in our American group and naturally made a special study of the health and humanitarian activities of the League that have developed on a world-wide scale. Like many other Americans I had not *known* much about the League's work for the health of the world, and probably nine-tenths of my hearers today have never even heard of the Health Organization of the League of Nations. After my study I am prepared to affirm that, if the League of Nations had failed in all else, its health organization alone, in its successful achievements and program of humanitarian service, would justify the League's existence before the bar of enlightened opinion.

Article 23 of the Covenant obliges the members of the League "to take steps in matters of international concern for the prevention and control of disease." Epidemic disease is an international matter. The history of the great plagues

*Radio Talk Over WGN

of the world will show the gradual growth of a feeling of international relationship. Men and nations do not live or die by themselves. Some of you remember the great epidemic of la grippe in 1890 that developed in Eastern China and Russia and in a few weeks swept around the world.

The world-epidemic of influenza in 1918 is still fresh in the minds of all. Dr. Norman White told us that in India alone during that one winter six million people died of influenza alone. More people *died* during this one world epidemic than were *killed* during the entire World War.

The Health Organization of the League was the direct result of the Health Conference in 1920 to meet the oncoming epidemic of typhus fever that was sweeping from Russia following the War. Typhus and relapsing fever had increased thirty fold in Russia and were spreading into Europe by way of Poland. If the League had not grappled at once and effectively with this menace that was sweeping into those small and inexperienced border states a world epidemic might have gotten started that would not have left America unscathed.

It is worthy of note that one of the first martyrs in the fight against typhus was our own Dr. Ricketts, of the University of Chicago, who lost his life in the mountains of Mexico while discovering and proving that typhus is contracted from the bite of an infected louse or tick. He found the cause, but not the cure for typhus. So in this critical time in Poland the health commission mobilized a great medical force, clothes, soap, drugs, vaccines and delousing machines, with motor transport, food and fuel. Fifty hospital stations with fifty beds each were established in a north and south line for cure and quarantine. It was a great fight, and the plague did not sweep Western Europe, but one hundred eighty-five of the medical staff lost their lives, for there was no known vaccine to give protection. A monument in Poland tells of their heroic martyrdom.

Although in this country we still have much to learn in the way of cleanliness, we are lucky to be free from those peculiarly horrible diseases which are spread by vermin. Under crowded conditions the control of vermin infestation is still a serious problem. At times these vermin take on tremendous powers of multiplication like the plagues of Egypt in the days of Moses. There are great scientists who fear that man's greatest fight for survival will be with the insect world.

The prevalence of lice among soldiers in the world war was never equalled before. No army was spared from wide-spread infestation by vermin and the diseases transmitted by these pests. Over 90 per cent of the troops were vermin-infested. Sometimes they were a real plague.

The story is told of a doughboy who had cooties as uninvited guests and who went to a drug store and asked for a pound of blue ointment. The druggist looked at him in a surprised way and said: "Why, a pound of blue ointment would kill a million cooties." "Give me *two* pounds," said the doughboy.

After Dr. White's work in stopping land-borne epidemic diseases sweeping from Russia through Europe, he made a tour through the ports of the far-east which have been the center of the great sea-borne epidemic diseases. Again, most of these plagues are transmitted by the insect world. On his suggestion, a central station was set up in Singapore and reports from 150 towns are received there each week, reporting all epidemic developments. This epidemic news is sent by wireless all over the world. It is picked up by ships at sea which are thus warned before entering any harbor where there is danger of infection. In the old days Europe and America fought cholera when it reached their shores. One of Turner's famous paintings portrays the burning of a plague infected ship in the river Thames. *Now* it is possible to be forewarned and attack the enemy before it arrives.

One great work of the League has been to secure joint action of the nations in combating the epidemic diseases of the world. It is really the first experiment in international sanitary cooperation on a large scale.

As an example, in 1922 following the Greco-Turkish war in Asia Minor, a great stream of destitute refugees began pouring into Greece that soon reached one-fifth of the population. Terrible unsanitary conditions soon developed. The Greek government appealed to the League of Nations and Dr. Nansen, of Polar fame, was sent and a preventive medical campaign was organized. Ten vaccination columns advanced in

the highest of all war, the war against disease, and vaccinated over half a million refugees against smallpox, cholera, enteric fever and other contagious diseases. The Greek government was helped in solving the tremendous sanitary problems that arose from this emergency.

The League of Nations literally has its fingers on the pulse of the world. Its medical experts, of international renown, find out how best to fight these great epidemic diseases and this information is published for the benefit of all. It has brought experts together to discuss their work. It has arranged for doctors from various nations to work side by side in one laboratory so that they could agree upon the best method of testing for certain diseases. It has arranged for tours of public health officers collected from nine or ten countries at a time who visit a number of foreign countries and study their sanitary methods. The Health Section is a great "pool of information" which both receives and gives that knowledge which makes the world healthier and happier.

SUPPURATIVE WOUNDS
THE USE OF GLYCERIN AS A TOPICAL APPLICATION

MANUEL E. LICHTENSTEIN, M.D.

CHICAGO

The satisfactory treatment of suppurative wounds has been a problem for a considerable time. Numerous applications have been suggested and used with the hope of diminishing the volume of wound secretion, exudate and debris while preserving the integrity of the constructive forces in the repair of the infected wound. Several of these may be mentioned. Alcohol in varying dilutions, but preferably 70%, has been found to be an excellent application for suppurative wounds. However, the intense pain occasioned by its application to a raw surface, especially when this surface is extensive, has rendered it prohibitive where frequent or daily dressings are necessary. Moist applications such as boric acid compresses which retain their moisture are usually of little value when drainage has already been established from an infected wound. It has been pointed out that continuation of such dressings produces only harm since blisters, furunculosis and even lymphangitis has been found to develop in the macerated skin produced by the wet compresses.[1] Chemical antiseptics are of definite value but in the profusely exudating wound dilution and surface removal are too rapid to permit of continual benefit following their application. The use of Dakin's solution, neutral sodium hypochlorite irrigations, hypertonic salt solutions, etc., are more suited to deep suppurative wounds and are impractical in the ambulatory case where the wound involves superficial portions of the extremities.

We have found in such wounds that the application of chemically pure glycerin is of definite value in diminishing the volume of exudate, inhibiting the spread of lymphangitis and reducing the swelling or bogginess usually present about such wounds. An experience with several thousand dressings in which this substance was employed demonstrated that dressings impregnated with a copious amount of glycerin were not painful when applied and could be removed painlessly and without disturbing delicate granulations developing under the dressings.

Glycerin owes its beneficial action to its antiseptic and hydroscopic properties. Ruediger[2] in studying the germicidal properties of glycerin found that this substance has a germicidal activity which varies directly with the temperature, being more potent at a temperature between 30° and 35° C than at lower temperatures.

Winslow and Holland[3] found that the antiseptic properties began in a concentration of 28%. A 100% solution of glycerin killed 90% of B. Coli in 3 hours. Compton showed further that glycerin had a different rate of antiseptic and germicidal activity on different organisms confirming previous work by Ruediger. The following table was compiled from a study of the growth of subcultures after contact with pure glycerin:

Organism	Antiseptic Response Hours	Bactericidal Response Hours
Enterococcus	48	60
B. Coli Comm.	15	18
B. Coli	12	15
Staphylococcus	12	15
Strep. Haemoliticus	6	8
Gonococcus	½	1

While glycerin dressings may owe their therapeutic potency in a measure to their mild antiseptic and germicidal properties, perhaps of greater importance is the abstraction of fluid from the wound and the probable reversal of

lymph flow to the wound surface peripherally instead of into the lymph channels directed centrally. In more than one instance we have seen spreading lymphangitis about a wound cease with no other therapeutic measure directed locally than the application of glycerin dressings.

Compton[4] has taken advantage of this property in the intra-uterine injection of pure glycerin with the hope of abstracting fluids containing toxins and organisms from the infected tissues following a post-abortive pelvic peritonitis.

The use of glycerin dressings is not at all a new procedure, having been employed for a considerable time in various combinations more commonly in a dilution with an equal part of 70% alcohol. While the latter application has distinct advantages as a local application extensive suppurative wounds become too painful to permit of frequent applications of this solution.

No bacteriological studies have been undertaken at the present time but the clinical use of glycerin in our experience warrants the following conclusions:

1. Glycerin, chemically pure, when applied to a suppurative wound at or slightly above body temperature aids in diminishing the amount of wound exudate.

2. Spreading lymphangitis and tissue swelling may be inhibited or diminished by frequent applications of this substance.

3. Removal and reapplication of dressings impregnated with glycerin are not painful and do not occasion as much discomfort as dressings commonly do in suppurative wounds.

4. Following the establishment of drainage from an infected wound subsequent to the use of hot wet dressings, glycerin applications are of distinct value in avoiding maceration and the development of superficial infections that commonly follow continuance of hot moist applications.

2558 W. Chicago Ave.

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RECENT ADVANCES IN THE STUDY OF BRONCHIAL ASTHMA*

LEON UNGER, M. D.
Assistant Professor Department of Medicine, Northwestern University Medical School

CHICAGO

In May, 1924, we established a new clinic at Northwestern University Medical School. This was for the care of patients suffering from the various diseases which we now classify as allergic in type. Up to date about 1,000 patients have been studied at this clinic. Included in the varieties taken care of are the following clinical conditions:

Bronchial asthma, which is the subject for tonight, comprises about two-thirds of all the cases and we diagnose it chiefly on the history of attacks of difficult breathing and wheezing with intervals of freedom between the attacks. Of great importance are the onset early in life, the strong tendency to hereditary transmission, and the positive skin tests in most cases.

Asthmatic bronchitis is characterized by dyspnea, cough and wheezing, with cough the main feature and with onset late in life, with absence of allergic and hereditary findings and with more or less constant distress.

The third member of the group is a newcomer and is called allergic bronchitis. Among others, Waldbott,[1] of Detroit, emphasized the great frequency of cases of bronchitis, without asthma, in which there is a sudden onset of a dry, unproductive cough; these cases occur in children, usually, frequently have an allergic family history, respond to ephedrin and epinephrin, and removal of the offending protein brings relief in most instances. It is in this group especially, where prophylactic treatment may be of great avail.

Allergic rhinitis, the fourth member, is a frequent condition and is more often termed vasomotor rhinitis or hypersensitive rhinitis. We believe the term allergic rhinitis is the best one as very frequently the patients are improved by treatment along the lines of allergy, which includes skin tests and removal of offending substances.

Hay-fever, urticaria, angioneurotic edema and eczema in children are common and comprise a considerable percentage of our material. In ad-

*Read before the Chicago Medical Society, January 9, 1929.

dition, there were a few cases of so-called food allergy, where patients have various gastro-intestinal upsets on eating certain foods. We also tested out a few cases of migraine, epilepsy, and miscellaneous skin diseases.

About fifteen per cent. of all cases studied were referred to the medical dispensary for further treatment. These patients were non-allergic and for the most part were cardiac cases with so-called cardiac asthma, some with hypertension and chronic nephritis; a few cases were luetic and these did well on specific treatment. Occasional mediastinal tumors and a few patients with pulmonary tuberculosis were found.

Let us consider bronchial asthma tonight as this is the most important of all.

All through the centuries asthma has been considered more or less incurable and even today there are many physicians, perhaps the majority, who still believe that there is no hope for the asthmatic. It behooves those of us, then, who have given special attention to the subject to try to bring to light the knowledge gained in recent years, in order that hope should replace despair.

The anatomy of the bronchi interests us especially as regards the muscle layer and the innervation. The muscle layer is almost entirely of the circular type and studies indicate that as the bronchi diminish in size with division the muscle layer becomes proportionately larger. The bronchi are entirely under the control of the vegetative nervous system. Stimulation of the vagus nerve causes contraction of these bronchial muscles. Stimulation of the sympathetic merely opposes the action of the vagus and so relaxes bronchial muscles which are constricted. Epinephrin acts by stimulating the sympathetic fibers and relieves paroxysms of asthma by inhibiting the constricting action of the vagus nerve, not by an opposing set of muscles—only one set of muscles has been described.

Sensory fibers of the vagus are plentiful in the epithelial layer and this explains the marked irritability of the mucosa to materials from without; these nerves therefore aid us in protection; but when asthma occurs their very sensitiveness brings on many attacks.

There are two main theories as to the manner or mechanism of the paroxysm of asthma, the theory of bronchospasm and the theory of edema of the mucosa. The theory that asthma results from a contraction or spasm of bronchial muscles, is strongly supported by experimental work in which actual muscle contraction occurs on stimulating the vagus nerve; and by the work done by Huber and Koessler[2] in 1922, who demonstrated, post-mortem, that definite hypertrophy of the bronchial muscles occurred in cases of chronic asthma.

The theory of edema of the mucosa as a cause of obstruction of the bronchi also has much in its favor. First of all, every other variety of allergy is characterized by local edema. This includes hay-fever, vasomotor rhinitis, urticaria, and even the skin tests used in diagnosis. By analogy, then, bronchial asthma may be caused by an exudation into the bronchial lumea with obstruction. Post-morten findings have also, in a few cases, shown swelling of the bronchial mucosa, and, lately, bronchoscopy offering direct vision, has enabled several observers to report marked edema during attacks of asthma. These two theories have their champions and the question is not settled. Probably the truth is that the same stimuli which cause bronchospasm also cause increased secretion and that the resulting bronchial obstruction comes from both sources.

There are other theories, less well supported, as to the mechanism of asthmatic attacks. One is that the asthma is a result of focal infection, from teeth, tonsils, sinuses, etc. There is little experimental evidence in favor of this theory and, clinically, permanent improvement from removal of these foci of infection rarely occurs. It is true that operations based on this theory are sometimes successful but most of us know only too well that the improvement, if any, is temporary in most cases.

Of chief importance in recent work on the etiology of bronchial asthma are the questions of heredity and allergy. Heredity has been shown to be all powerful. Studies by Cooke, Vander-Veer, Drinkwater[3] and many others have put the hereditary theory on such a firm basis that we must accept it and say that true bronchial asthma in most cases is handed down from one generation to another. It has also been shown that the tendency conforms to Mendelian law as a dominant characteristic. In addition, it has been demonstrated that where both parents suffer from some one or other allergic condition the children are almost sure to develop hay fever or asthma and at an earlier age; where there is

unilateral family inheritance the likelihood of passage to the offspring is less and the age of onset of allergic symptoms is later; and lastly, when neither parent is allergic, there is much less chance of allergy in the children and if such does occur it is usually much later in life than where hereditary influences are strong.

These statements are based on many statistics, among them the following: Cooke[4] found that 69.5 per cent. of children with bilateral hereditary influence showed some form of allergy or atopy as he calls it, and only 41 per cent. where no family history was obtained; furthermore, of these children, 72 per cent. with bilateral family history showed allergic symptoms before the age of ten; 35 per cent. with unilateral family history had symptoms before the age of ten; and only 20 per cent. where there was no family history at all. Balyeat,[5] of Oklahoma City, studied 1,000 cases with reference to heredity and found the following: 58.6 per cent. of cases with bilateral family history developed symptoms of allergy in the first decade and 32.3 per cent. with unilateral history. Only three cases with bilateral family history developed symptoms after the age of thirty. Incidentally, Balyeat skin-tested a number of new-born infants and found positive skin tests to wheat and egg in two cases. This, if substantiated, will be a strong argument in favor of the importance of heredity in bronchial asthma. Balyeat used as controls 1,117 normal university students—only 8 per cent. of these healthy persons gave a positive family history of asthma or hay-fever, as opposed to about 60 per cent. in patients with asthma and hay-fever.

A. E. Smith[6] has reported a family of 94 persons in five generations with special regard to hereditary occurrence of allergic manifestations. Of these 94, 56.2 per cent. suffered from one or other of the allergic diseases; 4 had asthma, 11 hay-fever, 15 vasomotor or allergic rhinitis, 17 urticaria, 6 angioneurotic edema, and 14 eczema. Twenty-three persons who married into this family were used as controls in this study; of these 23 only one was allergic.

It has been repeatedly shown that the children of allergic parents usually develop allergy but that the form in the offspring need not be the same,—thus the child may have hay-fever and the parent asthma, or vice versa.

Allergy is the other main line of advance in the study of bronchial asthma and its recognition has stimulated much research work. The word allergy, or altered reactivity, is very often confused with anaphylaxis. These can be readily distinguished if we recall that anaphylaxis occurs practically only in animals as a result of experimentation. A guinea-pig, for example, is given an injection of egg white and after seven to ten days the injection is repeated. No symptoms will result from the first injection, but after the second, if dosage and timing are suitable, the guinea-pig will have more or less marked bronchospasm, ending in recovery or death depending on the dosage. Under similar circumstances a dog has circulatory changes and rabbits have lesions in the pulmonary blood-vessels.

In contrast, allergy occurs only in man and with symptoms involving chiefly the respiratory and gastro-intestinal tracts and skin, thus giving rise to the clinical conditions we call bronchial asthma or hay-fever or allergic rhinitis or urticaria, etc. Now what causes allergy in man? We believe that it is a condition of hypersensitiveness or idiosyncrasy to some one or more substances which usually contain protein material, though not necessarily so; for example, most cases of allergy follow exposure to pollens, or animal dander, furs or feathers, or protein foods or orris root, the main ingredient of certain face powders. But there are frequent attacks following taking of aspirin and other drugs which contain no protein.

Then we have to explain why only a small percentage of people are victims of allergy. For example, why is it that most of us eat strawberries and no harm results? And why does about one person in a hundred break out with more or less severe urticaria or hives after eating these berries? And why does only about one per cent. of the population have hay-fever although we are all more or less equally exposed? The answer we now believe lies in the factor of heredity and we believe that heredity is the main predisposing factor to the entire group of allergic diseases. Although this explanation does not get to the bottom of the matter it has been accepted by the large majority of men who are giving special attention to allergic diseases.

Kolmer[7] in 1928, in reviewing the classification of allergy earnestly recommended simplifying the confusion in terms and he asked that the word "alergy" be used instead of "anaphylaxis,"

"idiosyncrasy" and "atopy"; and that the exciting agent be called an "allergen," instead of an "anaphylactogen," sensibilogen," "sensitinogen" or "atopen." We believe his suggestion an excellent one and adopt it with a view to doing away with the various terms used by different men.

The pathology of bronchial asthma offers little new evidence. Death during an asthmatic attack is rare, as we all know. However, Kountz and Alexander[8] recently reported three cases of death from bronchial asthma. Clinical and postmortem findings were given and it was shown that there was marked thickening of the muscle and subepithelial layers in the 3-6 mm. bronchi, thus confirming the work of Huber and Koessler; it was also found that the smaller bronchi were dilated and for the first time they showed that actual rupture of the basement membrane occurred with infiltration and destruction of muscle fibers by eosinophils as well as destruction of bronchial cartilage. They also reported that in two cases, one of twenty-five years duration and one of three years, that there was no demonstrable heart disease, despite the fact that one patient had persistent edema of both legs. This finding is in line with the fact that patients with bronchial asthma usually have good hearts.

We need not go into the symptoms of bronchial asthma except to emphasize once again the attacks of dyspnea and wheezing with freedom between attacks, and the early age at which symptoms begin, especially in those children who are unfortunate enough to have two allergic parents. This freedom between attacks occurs in the earliest years of bronchial asthma. As time goes on, however, the two main complications gradually set in, namely, emphysema and chronic bronchitis. These bring with them more or less constant difficult breathing and cough and we find that the child who could do anything between attacks now shows dyspnea on slight exertion. And we also find that our clinical results become less satisfactory when these complications occur and it becomes evident that the best time for treatment is before emphysema and chronic bronchitis are superimposed on the picture.

The diagnosis of bronchial asthma is usually easily made on the history as already given. Confirmatory findings are positive skin tests in most cases, eosinophilia in the blood, and eosinophils, Curschman spirals and Charcot-Leyden crystals in the sputum. X-rays usually show more or less evidence of generalized fibrosis beginning at the hila of the lungs and spreading out in a fan-like fashion. An important point is that epinephrin given subcutaneously will almost always relieve an attack of true bronchial asthma, especially if uncomplicated.

In our clinic and in private practice we put our asthmatics through a definite routine. Each patient has a complete history taken on a special form and a complete physical examination is made. Wassermann, urine and blood counts are also carried out, as well as sputum and chest x-ray examinations. Most of the patients are also seen by nose and throat specialists and where indicated sinus x-rays are obtained. A few have had bronchoscopies in addition.

A few words about skin tests. There are two main ways of performing these, the cutaneous or scratch method and the intracutaneous or intradermal method. We have adopted the cutaneous method and only use the injections into the skin as confirmatory or when cutaneous tests have failed us.

About 85 per cent. of all our cases of bronchial asthma give positive skin tests to one or more substances. In order of importance, we place animal derivatives first, such as horse dander, cat hair, and the various feathers; then come pollens, house dust, various foods and miscellaneous substances such as orris root. We test each case thoroughly and use about 150 to 200 tests in most patients, making about twenty-five to thirty scratches on the forearms at each sitting. We have been using the back only in infants or in certain cases where eczema or other skin disorder prevents us from making the tests on the forearms. We do not stop when we find a positive reaction as experience has shown that a patient may be and quite frequently is sensitive to more than one substance, and, correspondingly, will be most benefited by elimination of all offending materials so far as is possible. We believe group testing very unsafe and never use this method.

We go still further. We repeat all positives over and over again to be certain. And we are guided by Cook's postulates, namely, that firstly, the patient must come in contact with the substance which gives a positive skin test and,

secondly, that exposure to that substance should bring on an attack.

In the differential diagnosis we have very little trouble. Asthmatic bronchitis as stated before, comes on later in life, has no allergic nor hereditary findings, skin tests are negative, and cough is a constant symptom.

Cardiac asthma is quite common and is easily diagnosed on the history of dyspnea on exertion beginning in the later stages of life and associated with definite signs of cardiac diseases, such as enlarged heart, hypertension, accentuated second aortic tones, moist rales at the bases of the lungs and sometimes by enlarged liver and some edema of the lower extremities. In addition, arhythmias may be present and we are aided by x-ray and electrocardiographic findings. Skin tests are negative.

Pulmonary tuberculosis must be thought of and we know how frequently the two diseases are confused, even to the extent of putting an asthmatic in a sanatorium for tuberculosis. It is true that the two may co-exist, but repeated negative sputums in doubtful cases should make us suspect asthma, especially where there is a history of allergy in the family. When in doubt, it seems to me that we cannot afford to omit skin tests.

Other chest diseases occur, such as lung syphilis and mediastinal tumors. Inspiratory dyspnea should make us suspect pressure on a bronchus or larynx or a foreign body in the upper air passages. The dyspnea in bronchial asthma is chiefly expiratory in type. To illustrate, about a month ago a colored patient was admitted to my service at Cook County Hospital with a diagnosis of bronchial asthma. Examination showed loss of weight and marked dyspnea of inspiratory type; there was also an absence of breath sounds in most of the left lung. The diagnosis was changed to obstruction of the left bronchus and fluoro-scopy and x-ray showed some sort of a madiastinal mass, possibly a gumma. The patient has improved on luetic treatment.

The prognosis of bronchial asthma is undoubtedly more favorable now than formerly. It used to be considered a more or less incurable disease. Now we do not believe it is incurable. On the contrary, we think that we can improve or entirely alleviate the symptoms of the majority of cases of true bronchial asthma.

In our series of cases, both at the clinic and in private practice, about 85 per cent. of the patients with true bronchial asthma have shown improvement. About one-third of these have been completely relieved for a period of from six months to seven years. The remainder of the 85 per cent. are better but still have some symptoms. Pollen asthma cases especially have given most excellent results and asthma has very rarely occurred after pre-seasonal treatment.

Rackemann,[9] of Boston, has followed his cases much longer than we have and in March, 1928, reported 213 cases of asthma of all types completely relieved for more than two years. This was from a total of 1,074 cases, in other words, a so-called "cure," using the word "cure" to mean freedom from symptoms for two years or more, in 20 per cent. of his cases. Of these he found that the younger the patient the better the prognosis and he showed that 65 per cent. of his cases under twelve were either completely relieved or greatly improved. Every worker in this field has also learned that the younger the patient the better the results of treatment.

Other men report likewise. Gottlieb, Piness, Eyermann, Walker, VanderVeer and Duke all answered a questionnaire sent out by M. H. Kahn,[10] of New York, in regard to the curability of bronchial asthma. All reported many cases entirely relieved, although none use the word "cure." Kahn himself is less optimistic and he does not believe that asthma is curable.

The treatment of bronchial asthma is both prophylactic and active. With the almost unanimous agreement as to the tremendous importance of heredity in the cause of bronchial asthma and the other members of the allergic group, it behooves us to see what steps can be taken to prevent these sicknesses.

We know that where both parents are allergic symptoms of one or other variety of allergy will develop in about 60 per cent. of the children. If this fact, and it is a fact, were better known and broadcast to the laity and physicians alike, a forward step would result. First of all, then, inter-marriage between allergics should be frowned upon. This may seem radical, and I have not heard the idea expressed before, but if carried out there would be far less asthma and other allergic diseases.

Secondly, children with one or both parents allergic should be closely watched almost from

birth. Coughs, especially, should be noted as being possibly due to sensitiveness to some foreign substance. Feather pillows should not be allowed these children because of possible trouble from the particles of feathers. Either no pillows or kapok pillows can be used. One food new to the child should be added at a time and at least a week's interval pass before another food is given. This is because of the great frequency of sensitiveness to milk, eggs and wheat in infancy and early childhood.

Thirdly, exposure to animals should be restricted. Household pets, especially dogs and cats, should be forbidden and horseback riding discouraged.

Fourthly, at the very onset of any symptoms which may be allergic, whether it is eczema, or urticaria, or hay-fever or asthma, the child should be thoroughly examined and thoroughly skin-tested. Do this at once and the prognosis becomes excellent. Delay until the chest has become deformed and emphysema and chronic bronchitis have complicated an otherwise simple bronchial asthma and the child may be doomed to more or less continuous suffering. In few other diseases have we such a splendid opportunity to prevent and alleviate symptoms as we have if we promptly recognize an allergic family and adequately care for the children of this family. This prophylactic treatment represents a real advance in the study of bronchial asthma.

The treatment of bronchial asthma after it has occurred is divided into the specific and non-specific. There is little new work on the specific side. We make skin tests and we try to discover the cause. In most cases of true bronchial asthma we find positive tests and in most cases we get good results by removing the cause, where possible. In addition, we attempt to desensitize our patients to substances which we cannot adequately remove. These include pollens; egg, wheat and milk, the most common foods; feathers, horse dander, cat and dog hair, these last two because they are used very commonly for furs; and orris root, unavoidable because of its widespread use in face powders. We also attempt to desensitize those patients who are sensitive to house dust and usually treat them with an extract from dust gathered from their own homes. Desensitization has been attempted by subcutaneous injections of the offending substances, beginning with small doses and gradually increasing the strength of the materials. An important point in the treatment, often neglected and often a cause of failure, is the necessity of absolute avoidance, so far as is possible, of the substance for which treatment is being given. For example, it is not sufficient to tell a patient sensitive to egg to avoid eggs,—he must also avoid all egg-containing foods, such as ice-cream, egg-noodles, cakes and pastries, mayonnaise, and certain candies which contain particles of egg.

The non-specific treatment consists of the use of a number of different drugs and other methods of treatment.

Ephedrin has come to stay and is being employed very widely at the present time. We have been using it now for about three years and our results coincide on the whole with those of others. We have used both the sulphate and the hydrochlorid salts and have not seen any advantage of one over the other. We have used it by mouth only, giving from one-sixth to three-fourths of a grain per dose depending on the patient and the severity of the case. We have found that in about 50 per cent. of cases ephedrin helps to prevent attacks and to lessen those which do occur. We have learned, as others have, that all patients cannot take ephedrin, as it causes many to have untoward symptoms, such as tremor, palpitation, insomnia, weakness, excessive perspiration, nausea and vomiting.

Epinephrin or adrenalin still stands supreme for the treatment of attacks of bronchial asthma. Five to fifteen minims of 1:1000 solution hypodermically will relieve most attacks, at least temporarily.

We see no indication for the use of ephedrin hypodermically as its action while prolonged is too slow for use in severe attacks. But we do use it between attacks because of its prolonged action and because it can be taken by mouth. It is an important drug and a welcome addition to our list of medications, but it must be used with caution and its widespread use by the laity discouraged as it is a dangerous drug. For example, Bloedorn and Dickens[11] reported a case of cardiac decompensation due to ephedrin, and Chen, whose work put ephedrin on a firm basis, states that the drug should be used most cautiously, if at all, in cardiovascular diseases.

Other medications are numerous. Potassium iodid and belladonna are good symptomatic agents in loosening secretions and relieving spasms. Atropin we have found ineffective. Calcium therapy, with or without parathyroid or thyroid, has disappointed most of us and we believe its use valueless. Creip and McElroy,[12] recently examined 40 normal students and 167 cases of allergy, including 80 cases of asthma and found that both groups showed normal blood calcium figures (about 10.5 mg. calcium per 100 c.c. blood) and concluded that there was no basis for calcium therapy in allergy. They also tested 10 allergic cases before and after giving five grams of calcium lactate three times daily, with parathyroid extract for twenty days, and found no increase in blood calcium. They also showed that exposures to ultraviolet rays did not increase blood calcium. They also made gastric analyses in 50 cases of allergy and found 36 per cent. achlorhydria, 8 per cent. complete achylia, and 32 per cent. hypo-acidity (below 10 free acid), 28 per cent. normal and 6 per cent. hyperacidity (about 70). This work suggests that hydrochloric acid may be valuable in the treatment of allergic cases.

Peptone given by mouth and intravenously is inefficient, as shown by Ramirez[13] who treated 60 cases with it without any relief. We too have used peptone and abandoned it.

We have used ultraviolet light treatments for the last eighteen months as an accessory to other methods of treatment. We believe that it helps as a tonic. It seems to be especially valuable in children and undernourished adults. Our results have certainly been better since we started giving these exposures. It is necessary to emphasize that it has no specific value, but its use seems to help the appetite and build up the system.

Vaccine treatment is not often necessary in true bronchial asthma, but where secondary infection occurs we make autogenous vaccines from the sputum, plate out the main organisms, grow them separately and skin test the bacteria separately. Then we treat the patient with the one or more varieties which give the best reactions.

Removal of focal infections is carried out as far as possible. Infected sinuses, tonsils and teeth are taken care of and sometimes good results occur. We do not believe that straightening septums and removing turbinates help.

SUMMARY

In conclusion we wish to emphasize the following points:

1. Heredity is very important and the closer the relationship the more probable it is that the children will develop one or other of the allergic diseases; and the closer the relationship the earlier will such symptoms appear.

2. The conception of allergy with its use of skin tests has been a big step forward and treatment based on it has enabled most bronchial asthma cases to be either entirely or partially relieved of symptoms.

3. Skin tests should be thoroughly and completely done or not at all. Testing with ten or twelve materials may be very misleading.

4. The earlier the diagnosis of bronchial asthma is made and the earlier treatment is begun, the better the prognosis. After emphysema and chronic bronchitis have occurred there is less chance for complete recovery.

5. Prophylactic treatment can be very successful and demands propaganda against intermarriage between allergic patients, close observations of children of allergic families, and observations of children of allergic families, and screening such children, so far as is possible, from the more common foreign substances which may precipitate attacks.

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185 N. Wabash Av.

CARDIAC IRREGULARITIES, THEIR CAUSE, RECOGNITION, AND TREATMENT

JAMES G. CARR, M. D.

CHICAGO

Cardiac irregularities may be discussed under five general headings, premature contractions, auricular fibrillation, paroxysmal tachycardia, conduction disturbances and sinus arrhythmia. The premature contraction, often called the extra-systole, may be auricular, ventricular or nodal in origin. In a strict sense the term, "ectopic beat" is more descriptive, for the premature contraction is actually a contraction, the stimulus to which has come from some focus other than the normal, from some area in the auricle other than from the sinus node, or in the junctional tissue or the ventricle from some focus in these areas rather than along the normal paths from the auricle. Whether the etiological factor be anatomic or functional, the physiological process is the same, from some abnormal focus an impulse to contraction arises which is followed by cardiac response, early in time. Cardiac irregularity is probably most often due to premature contractions. These may be the result of nervous, toxic, infectious, or anatomic conditions.

The nervous factors may be broadly grouped as general and reflex. Under the general causes we include those disturbances of the nervous system classified as constitutional. Ectopic ventricular beats are often found in individuals of a nervous type particularly during some unusual mental or physical strain or shortly after the termination of such. Even in individuals who are not obviously of a nervous type the strain of some anxiety or exceptional mental work may be accompanied by the appearance of premature contractions. The reflex causes are mainly abdominal. Attacks of irregularity due to the presence of premature beats may be associated with chronic digestive disturbances, exacerbations of gall-bladder disease, abdominal distention or an acute indigestion with nausea and vomiting. Not infrequently the first appearance of such an arrhythmia occurs during the night, after the patient has taken a late evening meal of various rich and indigestible foods. Again patients have noted the onset of such symptoms after a heavy meal had been eaten when the patient was exceptionally tired. The relationship of gall-bladder disease to premature contractions is of interest. There has been much discussion as to whether the irregularity which is found in association with such disease is reflex in character or the result of myocardial disease, definitely organic in character, the result of infection of the myocardium from the gall-bladder. The ease with which ectopic beats can be excited experimentally by stimulation of the gall-bladder is presumptive evidence that clinically, such irregularity is reflex in character rather than myocardial. The toxic causes are many, of which two, coffee and tobacco, are most important. The patients themselves have many times noted that the drinking of coffee or the smoking of an especially strong cigar or even of a cigarette will be followed by the appearance of extra-systoles, the onset of a cardiac irregularity in which the heart seems to stop and then to start with a thump or "flop." Some drugs will also produce premature conditions, notably digitalis. This drug given to the point of intoxication will excite premature contractions through its power to increase ventricular irritability; indeed, the onset of the coupled pulse, the pulsus bigeminus, in which each normal beat is followed by an ectopic ventricular contraction, if occurring during the course of digitalis medication, is so commonly the result of overdosage with the drug, that its immediate withdrawal is indicated. The power of digitalis to produce various types of ventricular irregularity is not sufficiently appreciated.

It is now some forty years since the studies of various workers, notably of Romberg, made clear the fact that the acute infections are commonly accompanied by myocardial disease. The relationship of infection to the cardiac irregularities has been the subject of investigation ever since and has received not a little impetus from the clinical use of various instrumental methods. It may be stated that the onset of premature contractions may be attributed, in many instances, to the presence of some acute infection. Of such infections, diphtheria, influenza, the rheumatic infections, typhoid and pneumonia are especially prone to leave an injured myocardium and to be followed by a disposition to the occurrence of ectopic beats. It has been contended that the irregularities accompanying

the acute infections may be explained as toxic, the result of the effect of the particular toxin upon the myocardium, either directly or through the medium of the nervous system, but there is sufficient evidence at hand to warrant the statement that these arrhythmias may be definitely correlated with disease of the myocardium. It may be accepted that the later results of acute myocardial change are often responsible for persistent ectopic beats or other forms of irregularity in after life. The connection of chronic foci of infection with premature contractions in the sense that the latter are due to myocardial disease which has been initiated from the focus in question is much more difficult to maintain. A priori we may plausibly argue that the chronic infection is as likely to produce involvement of the myocardium as are the acute infections, but convincing anatomic studies are yet lacking and the theory that cardiac irregularities may be the remote result of a chronic infection though a chronic myocarditis is not proven. There remains for mention those types of ecoptic beats which are due, so far as we can determine, to the presence of anatomic diseases, degenerative in nature. The individual with arterio-sclerotic cardiac disease is likely to manifest cardiac arrhythmia due to ectopic beats. While these are often of the ventricular type, all forms occur and it is a matter of clinical observation that auricular and nodal ectopic beats are far more common in association with definite organic disease, either acute infectious or degenerative, than as the result of purely toxic or nervous factors. Premature contractions are a common finding in people past middle life, and are especially frequent in all the forms of cardiac disease common in these years, in the hearts of hypertension and arterio-sclerosis. In a manner, age may be regarded as an etiological factor. It seems possible to explain the facts only upon the assumption that often these are the earliest manifestations of incipient anatomical change which is not otherwise accessible to demonstration. It is my opinion that auricular and nodal ectopic beats are not often found except in the presence of organic disease, while the more opportunity one has of studying the incidence and etiology of premature ventricular contractions, the stronger becomes the conviction that an anatomic cause for premature beats should be carefully searched for in every case. It is not to be denied that in many instances the latter occur without any warrant for explaining them upon an anatomic basis; yet I believe that in the physician's mind, the possibility of their relationship to pathologic change ought not to be too easily discarded.

In passing, it may be stated that premature contractions occurring in the course of a cardiac decompensation often markedly diminish as the compensation is restored. It is probably not correct to attribute this improvement to the direct effect of digitalis; it is rather due to the restored function of the myocardium.

It is comparatively easy, in the large majority of cases, to recognize the ectopic ventricular beat by clinical means alone. In these cases the rhythm is fundamentally regular, the irregularities are noted as interruptions to an otherwise regular rhythm or perhaps as recurring with regularity. Following the premature beat there is a long pause, the compensatory pause, and when the pulse is quickened by exercise the arrhythmia disappears. As the rate slows again the irregularities may recur in even greater number, but, while the pulse is rapid, there is no premature contraction. While the ectopic ventricular beat is readily recognized upon the findings described, other varieties of ectopic beats do not permit of such satisfactory clinical diagnosis. All of the types of ectopic beats become less frequent as the pulse quickens, but the compensatory pause is usually absent after a premature auricular contraction and this feature, when the abnormal beats are numerous, makes difficult the differentiation from the absolute irregularity of auricular fibrillation. Ectopic nodal beats are hardly accessible to diagnosis independently of instrumental examination. But the general rule holds, since premature ventricular contractions are so much the more common, that the diagnostic criteria given above are of much clinical value.

The discovery of premature contractions is, in itself, no indication for treatment other than the assurance to the patient of the relative unimportance of the condition. The significance of this form of irregularity depends upon the underlying cause. In many cases, however, some form of treatment is required, partly because of the disturbing effect upon the patient provoked

by the irregularity, the anxiety which comes from the attacks of palpitation and the belief that heart disease is present, and partly because the ectopic beats may occur in short paroxysms in such frequency as to produce some cerebral anemia and cause spells of dizziness.

Treatment is primarily dependent upon the underlying etiology. In the nervous type, the reassurance of the patient concerning the insignificance of the arrhythmia, the removal, if possible, of the particular exciting cause, the general regulation of the life, particularly as to overwork, undue social activity, late hours, and directions about food and regular habits of eating may be sufficient. Often bromide must be prescribed, at least, for a time, until the patient has become satisfied that the irregularity does not portend sudden exitus. The same general observations apply to the group in which the irregularity results from some toxic cause, such as coffee. Tobacco, coffee, or any other toxin suspected of being the causative agent should be withdrawn. In both of these types of cases it may be necessary to resort to drug treatment, in order to control the arrhythmia. If the bromides fail to give relief, the quinine derivatives may be employed. Either quinine hydrobromide or quinidin sulphat may be used. Either may be given in doses of 8 to 12 grains a day in divided doses of 2 or 3 grains each. Relief is often obtained and much dependence may be laid upon this form of medication. To present the results of such therapy is very difficult. In a fairly large proportion of cases the disturbances that are attributable to the irregularity are purely subjective, dependent upon the patient's own estimate and report; it may be that the attacks occur regularly at night, often just after the patient has composed himself for the night and the physician never has the opportunity to determine for himself how aggravated the irregularity really is. Hence, the effect of medication cannot be determined by objective observation but must be measured by the patient's own statements. During an acute infection treatment should be directed to the underlying disease. Where premature contractions occur later, signifying chronic change in the myocardium, the quinine preparations may be used. Recurrence of the acute myocarditis should be guarded against by protection against fresh infections and care in the presence of such. The question of the removal of chronic foci of infection is not easily answered. It is my opinion that such foci should be removed if there is reasonable ground for assuming a causative relation of the focus to the arrhythmia. Cardiac irregularities are often due to abdominal disease, as reflex manifestations; or it may be as the result of secondary infection. When the primary cause is removed the cardiac arrhythmia may disappear, yet one hesitates to advise, without the opportunity to elaborate with due consideration of the many angles of the subject, the prompt removal of foci of infection, which removal can only be carried out by a major operation. Infected teeth and tonsils may be removed, but the patient should be warned that no one of us knows whether or not in any particular case the focus of infection is responsible for the irregularity and no promise of relief should be given. I find it difficult to lay down hard and fast rules because I have none for myself; each case must be decided upon its own merits. If one follows set lines of procedure, as much harm may be done by the indiscriminate removal of foci of infection as by their entire neglect. The use of cardiac stimulants in these cases should be discouraged. If such drugs are followed by the cessation of symptoms, it is probable that the happy result is due to the relief of the patient's anxiety by the administration of medicine rather than from any favorable effect of the drug. Caffeine, strychnine, and digitalis are more likely to aggravate the irregularity than to stop it. They are not indicated. Perhaps the frequency of the ectopic beats is lessened in cardio-vascular syphilis after specific treatment. About that I may not make a positive statement. If the theobromine derivatives prove to effect in clinical medicine what they have shown to do experimentally—improve the coronary flow—this may offer some hope of relief in the cases associated with degenerative myocarditis of later years; a better noruished muscle may be less irritable, but there is no warrant for anything more than a guess in this connection in the present state of our knowledge.

Next to the premature contraction in the order of frequency of occurrence is auricular fibrillation. The causes of this condition may be grouped as five, of which the first three make up, if I may venture to estimate, at least 95%. These three are arterio-sclerosis, mitral disease

and hyperthyroidism. Fibrillation is found in more than 50% of rheumatic hearts with decompensation. Fibrillation may also occur in the course of acute infections and may result from reflex stimulation. While not denying its possibility, fibrillation upon a purely nervous basis is certainly rare.

Auricular fibrillation may be recognized clinically by the absolute irregularity (it is impossible to identify an underlying rhythm or to demonstrate compensatory pauses) by the marked aggravation of the irregularity after exercise as opposed to the contrary result when premature contractions are present, by the aggravation of a pulse deficit after exercise, and by the history or the presence of some one of the causative conditions just mentioned. The presence of arterio-sclerotic cardiac disease, of mitral disease with decompensation or of hyperthyroidism, is strongly presumptive evidence that a cardiac irregularity of any degree is due to auricular fibrillation. By pulse deficit we mean a difference between the ventricular rate counted at the apex and the pulse rate. In auricular fibrillation the ventricular rhythm is absolutely irregular; often the ventricle contracts before it has regained its full contractile power or has become normally filled with blood, the result of which is an ineffective impulse which produces a weak arterial impulse often so weak that no radial pulse is produced. When the ventricular rate is rapid, there will be many contractions so weak as to be missed at the wrist; as the rate is slowed, there is more time during each rest period for the ventricle to fill or to regain its full contractile power, so that the slowing of the rate is associated with a diminution of the pulse deficit, but a pulse deficit is a regular accompaniment of the rapid and irregular ventricular action of auricular fibrillation. As the ventricular rate is slowed in fibrillation, although the rhythm remains irregular, a pulse deficit is not necessarily present. With the slowing of the ventricular rate, the longer period of rest permits normal filling of the ventricle and normal recovery from the refractory phase so that each ventricular beat may produce the usual impulse at the wrist.

In the consideration of the treatment of auricular fibrillation we may discuss separately the chronic and paroxysmal types. The mere presence of the chronic type of fibrillation is not an indication for treatment. Many elderly people have auricular fibrillation with a moderately slow ventricular rate and without symptoms of cardiac disease or of annoyance from the irregularity. This is also true of some patients with rheumatic heart disease. In the latter the condition is apt to be troublesome because of the arrhythmia alone. Since the rate in auricular fibrillation increases very notably after exercise and the rhythm becomes much more disorderly, the presence of this condition is likely to be more noticeable in younger persons whose normal activities frequently cause acceleration of the cardiac rate.

In the decompensated heart with fibrillation digitalis exerts its most constant and satisfactory results. The effect of this drug is to slow the ventricle by its power to inhibit the passage of impulses from the auricle to the ventricle. This effect of digitalis is principally upon the conduction tissue through the medium of the vagus; digitalis produces vagal stimulation and vagal stimulation impairs conduction. But digitalis has a specific action upon the heart in fibrillation, and exerts an effect upon conduction even after the vagus has been paralyzed by atropine. It is probably this particular response to digitalis which accounts for the striking results usually obtained from digitalis in auricular fibrillation. Digitalis will slow the rate and increase the cardiac output with the disappearance of the signs and symptoms of decompensation, but it does not restore the normal rhythm. The slow and oftentimes apparently regular pulse which ensues does not signify the restoration of normal rhythm; the ventricular rhythm, if carefully examined, will be found to be absolutely irregular. In the use of digitalis in these cases the aim of the treatment is to get the full effect of the drug; the old rule of Withering applies: "Continue the digitalis until its effect is shown upon the heart, the stomach, the kidneys, or the bowels." The drug should be given until the cardiac symptoms recede or definite signs of the physiological effect indicate that full effect of the drug has been obtained though the desired therapeutic result is not obtained. The digitalis may be given according to the method of Eggleston whereby the physiological dose is given within 24 hours, the drug is then omitted for 48 hours and afterwards given in a so-called equilibrium dose of 20 to 30 minims of the tinc-

ture once a day. The condition for the use of this method is that the patient must not have had digitalis within ten days. If digitalis has been taken a few days before the employment of the Eggleston method it is to be expected that the body contains a certain amount of the drug, which added to the quantity given to produce physiological effect will almost certainly produce a toxic effect. According to this method, 1 cc. of the tincture is given for every seven pounds of body weight after making allowance for excess weight which is due to edema. This means for a patient with a net weight of 140 pounds a dosage of 20 cc., 5 drachms, to be given within a period of 24 hours. The drug should then be omitted for two days and again administered in the equilibrium dosage as mentioned already. Owing to the variable response of different individuals, some toxic effects are not uncommon in spite of rigid adherence to the precautions stated. If it is not deemed wise to employ this scheme, the drug should be given in fairly large doses until the desired effects are produced and then cut down to the amount necessary to keep the heart under control. I cannot leave this subject without calling attention to the fact that digitalis is a potent drug which is capable of causing dangerous symptoms. The change in our conceptions as to the dosage of digitalis which has marked the past decade has apparently led many men to forget the potency of the drug for harm as well as good. While the doses advised by a previous generation were far too small, the fact that larger doses are advisable and to the advantage of the patient does not mean that the drug is harmless. It is rather to be emphasized that the larger doses carry some risks to the patient and demand greater watchfulness on the part of the physician. In estimating the effect of digitalis upon the heart, the cardiac rate should be counted over the apex; readings of the radial pulse are not reliable.

Though quinidin may restore and maintain the normal rhythm, it is not to be regarded as useful in the treatment of cardiac decompensation. The quinine derivatives are cardiac depressants, impairing rather than increasing cardiac tone and, while there have been occasional cases in which decompensated hearts have shown improvement of function after the restoration of normal rhythm by quinidin, its use in decompensation is not advised. Where quinidin has acted to restore compensation with the return of normal rhythm, it has probably been due to the predominance of the favorable effect upon cardiac output of the regular rhythm over the depressing effect of the drug itself. There is not time to discuss here the indications for the use of quinidin, but it may be said that the use of quinidin in chronic fibrillation is principally to relieve subjective distress in those individuals who are greatly annoyed by the irregularity Where the drug is used, the heart should be compensated and the digitalis withdrawn. A test dose of 3 grs., given twice with an interval of four hours, should be employed on the first day of the treatment. If no untoward symptoms occur, the attempt to restore normal rhythm may be undertaken. Three grains may be given every two hours for seven doses and this continued for 3 days. If the irregularity persists, the dose may be increased to four grains every two hours for seven doses a day and kept up for another four days. If the rhythm is not restored at the end of the week, the drug should be stopped. Rarely does restoration of normal rhythm occur after seven days of failure to respond. The drug should be withdrawn at any time the symptoms of cinchonism appear, or if the ventricular rate goes as high as 130. After restoration of normal rhythm quinidin may be continued in a daily dosage of from 5 to 10 grains given in divided doses. From 5 to 10 grs. a day have been given through long periods without disturbance, but the patient should be warned of the symptoms of quinine intoxication, not forgetting the visual disturbances. The treatment of paroxysmal fibrillation includes the removal of the cause, symptomatic treatment, and the use of quinidin. Paroxysmal fibrillation is usually due to one of three causes, mitral disease, and hyperthyroidism, in both of which it appears that the paroxysms presage the eventual establishment of a chronic fibrillation, and the degenerative changes in the myocardium which ensue upon a coronary thrombosis. If there is a history of coronary thrombosis the attacks of auricular fibrillation may be readily explained. Where there is an old mitral endocarditis especially with stenosis, fibrillation may be expected. In the absence of rheumatic heart disease and a history of coronary thrombosis, the occurrence of paroxysms of fibrillation is an indication for a determination of the basal metabolic rate, so

often are these attacks due to thyrotoxicosis. Where the latter is present a successful thyroidectomy will put an end to the attacks; indeed, it is not uncommon to have restoration of normal rhythm after operation in patients who have had chronic fibrillation; it is also well established that quinidin is especially ineffective in thyrotoxicosis, while after thyroidectomy the patient, previously refractory, will often respond. At the time of the paroxysm of fibrillation, the use of sedatives is often of value in quieting the patient, allaying his anxiety and thus contributing to recovery. While the cardiac rate is rapid, digitalis should be given; after the rate has been slowed to within nearly normal limits, quinidin may be given in doses of three or four grains every four hours for several days or until the restoration of normal rhythm; thereafter this drug may be continued in daily dosage of 5 to 10 grains, in divided doses. While quinidin will not always finally prevent the attacks, it does have a favorable effect in diminishing their frequency.

Paroxysmal tachycardia is a condition in which there is the sudden inception of a rapid rate; the paroxysm is characterized by the sudden onset of the tachycardia and usually by a sudden offset, although the return to normal rate may be gradual. The rhythm is not always regular; paroxysms of fibrillation have just been described. There is some dispute as to whether or not paroxysmal tachycardia always arises from an abnormal focus. That opinion has been held, but the view that such attacks may result from abnormal stimulation of the usual pacemaker is no longer entirely rejected. The rate becomes very rapid, often around 180, and many cases have been described in which the rate was over 200. I recall two cases, one in a man about 55, with a rate of 210, and another recently seen in a child of 17 months, with a rate of 230. The attacks are of variable duration. There may be short runs of tachycardia barely perceptible to the patient yet which are to be classified as paroxysmal tachycardia. The usual attack last from a few minutes to hours; more severe attacks will persist for days and may occasionally end fatally, although such termination is unusual. In the greater number of cases the attack is significant because of the subjective sensations produced and is not associated with signs of cardiac failure. The patient notes the rapid action and cannot restrain some anxiety; there may be no apparent breathlessness, partly because the knowledge of the condition leads the patient to refrain from exertion. Frequently there is a sensation of tightness in the chest, a sense of fulness under the sternum, but this rarely amounts to pain. Where the attack is of longer duration there may develop cyanosis, dyspnea, swelling of the liver and some edema of dependent portions; with persistence of the paroxysm the pulse pressure falls, often quite notably, and cardiac failure begins to develop. With the sudden cessation of the attack the patient immediately feels relief and within a short time is free of all the symptoms. These attacks develop mainly upon a nervous basis, by which we mean that in a given case neither history, signs, nor symptoms of organic heart disease can be discovered; upon a rheumatic basis, in which there is demonstrable rheumatic heart disease or the history of some disease of the rheumatic group which is likely to be followed by cardiac involvement, and finally, upon an arterio-sclerotic basis. Paroxysmal tachycardia is often associated with arterio-sclerotic heart disease and this is the group to which fatal attacks are almost confined. The treatment is directed first of all to the exciting cause. Even in those attacks due to organic disease, the attack is usually precipitated by some nervous factor. To protect the patient from undue physical, mental or emotional strain is a first principle of treatment. Much that has been said about the avoidance of dietary indiscretions in the prevention of paroxysmal fibrillation applies here. Perhaps the quinine preparations are of value in diminishing the frequency of these attacks. They should be tried. It is difficult correctly to appraise them. During the attack the best treatment is to administer a sedative; if the patient will sleep, the attack usually stops. Bromides are especially of value. Morphin is dangerous in this group of cases—patients of a nervous temperament with a tendency to recurrence of the attacks—but may have to be used in cases of long duration, especially in older people with arteriosclerosis. Many procedures have been found of value in individual cases. Some patients can stop the attacks by holding the breath, or by taking a drink of water; in some, vomiting will put a stop at once to the rapid rate. It is in these cases that vagal pressure often

effects prompt relief. In general, the prognosis as to life is good but the attacks often occur with such frequency and severity as to become very burdensome.

The irregularity which results from disturbances of conduction is due to partial heart block, occasional failure of ventricular response to auricular impulse. In complete block the auricular and ventricular rates are independent of each other, but the rhythm of each is regular. The characteristic of ventricular contraction in complete block is not irregularity but bradycardia. The rate is usually below 40. Incomplete block may also show a regular rhythm, dependent upon whether or not the "dropped beats" come at regular intervals, as happens in the grades of block in which every second or third auricular impulse fails to excite a ventricular response. Such a block may cause a slow ventricular rate. In my experience this type of block is rare.

The causes of heart block are several. Digitalis, the effect of which upon the conducting tissue has already been mentioned, and other drugs may be causative. Acute infections, the rheumatic infections, influenza and particularly diphtheria, are often responsible. Usually the conduction disturbance disappears as the infection recedes, but in diphtheria the block may be permanent and occasional cases are seen with the slow ventricular rate of complete block for years after this infection. Incomplete block is most often the result of toxins or infectious processes. Complete block, dissociation of auricle and ventricle, may result from the same causes, but is almost never permanent under these conditions except after diphtheria. The common cause of persistent complete block is arterio-sclerotic degenerative myocarditis involving the Bundle of His. Syphilis is often mentioned as a cause of this type and especially through the presence of gumma in the Bundle, but is actually an infrequent cause.

Incomplete block with arrhythmia is characterized by the occasional failure of ventricular response to auricular impulse. Clinically, this is shown by the occurrence of long pauses, not only at the pulse but also over the heart itself. When a long pause at the wrist is due to an early ectopic ventricular beat which has not produced a peripheral impulse, auscultation at the apex will reveal the presence of the early premature contraction; in incomplete block, auscultation at the apex reveals a silent period which is synchronous with the long pause at the wrist. It is obvious that some ventricular beats are missed altogether. Neither radial pulse nor cardiac contraction may be discovered during this long pause. Unless jugular pulsation indicative of auricular activity can be observed during the pause, no other sign of incomplete block is available without instrumental demonstration.

The treatment of block is concerned first with the withdrawal of an exciting toxin and with the control of a causative infection. The chronic forms of block, either partial or complete, have hitherto proved refractory except in those cases due to syphilis. Of recent years atropine, adrenalin and thyroid have been recommended by various workers. Quite recently barium chloride in small doses has been highly spoken of for the treatment of the syncopal attacks, Stokes-Adams disease, either of complete or incomplete block. About no one of these drugs may definite statements be made at present.

It remains to discuss the type of irregularity known as sinus arrhythmia. This is also known as respiratory arrhythmia, and Mackenzie referred to it as the "youthful type of irregularity." It is the result of increased vagal effect upon the sino-auricular node or of heightened response of the nodal tissues to vagal control. The condition is found particularly in the extremes of life, in children and old people and in many individuals of a nervous type. It is often carried well on through the period of adolescence. There are alternating periods of a slow rate with one more rapid, the rapid rate being synchronous with inspiration and the slow with expiration. Exaggerated breathing will increase these phasic variations. Instrumental examination will show normal impulse formation, normal conduction and normal ventricular response. This type of arrhythmia is physiological, offers the prognosis of a healthy rhythm and calls for no treatment. Further diagnostic criteria are the diminution of the irregularity as the pulse quickens after exercise, and the absence of symptoms, signs, or history which warrant the diagnosis of cardiac disease. It is important to recognize this benign and frequent irregularity, for oftentimes a bad prognosis based upon its presence is the source of much distress to a patient.

MEDICAL EDUCATION*

FRED H. GUNN, M. D.

EAST ST. LOUIS, ILLINOIS

Of the many subjects with which a physician has to deal, none is of any greater importance than the training of young men who are to take up the work in the future. Hyppocrates recognized this principle, and ever since that time physicians, as a whole, have taken an active interest in the future of the profession.

The advent of scientific medicine has dampened the ardor of the men engaged in general practice. It is not because of a lack of interest, but a lack of contact between the teachers of medicine and the men in general practice. It is because of the submission of the men in the active practice of medicine to the dictation of the teachers of medicine who, in greatly increasing numbers, are becoming more and more the full time teachers who have no means of understanding the art of the practice of medicine. Many of them, indeed, know nothing of the practice of medicine at all. In my experience they are men of fine principle and are very desirous of having their students efficient in the special branch for which the individual is responsible. Furthermore, they are men who know the branch they are intrusted to teach much better than it would be possible for any but the full time teacher to know. But, in so far as knowing the application of the subject matter to the treatment of the sick, they could not be expected to have more than a mere academic knowledge.

The result is that the present student of medicine reaches his third year in the study of medicine with no idea of the meaning of the profession he intends to enter. He has had four years in high school, two years in the university, and two years in the medical department. And yet, he has no more knowledge of the practice of medicine than he would have had, had he taken up engineering. He has been constantly in school all his life and has been too busy in learning what is taught by his various teachers to come in contact with the great world and its many deficiencies and difficulties. He has been engaged in exact science, and, if he has mastered the subjects presented to him, he is supposed to be eminently prepared to enter his third year, and for the first time in his life he begins to come in contact with men who actually treat the sick.

In order to reach this stage of his career successfully, he must have a particular taste for science and research, or his task will grow so irksome that he will eliminate himself or will be eliminated by the medical school for inefficiency. On the other hand, he may have little human sympathy, few qualifications and no inclination to practice the art of healing, but may still have a superior scholastic standing in his school.

Unless his curiosity gets the best of him, he may spend four years in medical college without ever meeting a man who practiced medicine and without ever hearing the history of a sick or injured patient. In his fifth and sixth years, he comes in contact with men who specialize on limited subjects. Many of these men never practiced general medicine in their lives, and more and more of them are becoming men who are working on salaries and are handling patients, principally of the pauper class who are used for research purposes. And these men may never have had any experience in handling any but pauper and referred patients. A general practitioner may be a curiosity to a senior medical student.

Dr. William Mayo's definitions of the general practitioner and the specialist are:

"The general practitioner is a man who knows less and less about more and more; and, a specialist is a man who knows more and more about less and less."

Both definitions are concise, but very expressive.

You may have known a man in your life who could shuck more corn than it would seem possible for one man to shuck. But, he was not necessarily the best farmer in the country. He was a specialist. If farm problems were to be discussed, he would probably not be considered. From the viewpoint of farming, you could pick from any community the men who know but one phase of farming, but know that phase better than any of the rest. And then, you would find a man who probably could not do any one thing as well as any of these specialists, but

*Presidential address at Annual Meeting of Southern Illinois Medical Association at Mt. Vernon, Nov. 8, 1928.

who would know more about farming in general than all of them put together.

I do not intend to belittle the specialist on the farm or in the medical profession. The fact is that the greatest men of our profession in the past have become specialists, and still remain the leaders of medical thought. But, we must not forget that the specialists of past generations graduated from the general practice of medicine into their specialties, and the majority of them continued to keep in close contact with medicine in general. Many of our best specialists today are no closer to the ideas of general medicine than are our dentists. Have you ever heard any of them boast about the fact that they know nothing of medicine except that which pertains to their special branch?

Specialists and research workers have delved into the minute details of medical science and have produced ideas that will live forever. They have placed medicine upon a basis that was not dreamed of fifty years ago. They have worked and toiled, with but little encouragement, just as geniuses of all kinds have done. No intelligent individual would ridicule the specialist or the research worker. At all medical gatherings the science of medicine is eulogized, and every eulogy is deserved by those who have added to the science of medicine.

On the other hand, however, the eulogy of the old family physician is full of pathos. The orator brings tears to our eyes with the description of his sacrifices, his poverty, and his devotion. And, when our tears are dry, we try to forget him.

The art of the practice of medicine has received very little constructive thought at the centers of medical learning during the past generation. Science has held our attention so completely that our medical education is becoming so filled with mechanical manipulation that we forget that our typhoid patient has anything else but typhoid. We pass him by without realizing that he has a mind and a soul. We ask about his father and mother only to get his family history into our records. We ascertain that he has a wife and a child. But, is it because we have an interest in his welfare? Or, is it merely for a scientific record?

When there is suffering in a family, the mother, father, brothers and sisters are all anxious to see the sufferer relieved. There is nothing that interests the patient as much as relief and consolation. He wants assurance. Death must be met in spite of science. Surrounded with every thing that science can boast, thousands of individuals are doomed to invalidism. All science can do is to absent itself from the presence. Then comes the artist who has made the medical profession the most beloved of all professions. It is the artist who has placed the halo upon our brows.

In order to allow scientific principle to be executed, it is necessary to have the art of medicine applied. Who sends the stricken individual to the specialist? Who diverts him from the charlatan? From a purely scientific viewpoint, is it wise to leave the rural districts depleted of medical aid? If our young men are educated to such a point that they are unable to find solace in anything but a specialty, where are their patients coming from? If the slightly indisposed are to consult the druggist, the nurse or the cure-all, it must be their duty to determine the advisability of medical attention. It must fall to their lot to direct medical supervision and to create medical thought.

When we look into statistics and learn that only ten per cent. of the human ills can be classified as amenable to scientific diagnosis, classification and treatment, and that only ten per cent. can be treated scientifically—in the true sense of science, it gives us an idea of the magnitude of the field in which the art of medicine must be applied—if the best results are to be obtained.

It is my opinion that human ills cannot be handled as well by any method as by a single body or profession who look upon them as a whole. The medical profession cannot be divided into a scientific and a non-scientific body with different ideas and ideals without coming to cross purposes. Before such a division is effected, it will be well to make an adjustment. That adjustment must be made in our schools of learning. Teaching must adjust itself so that science will be made an adjunct to the practice of medicine rather than to insist that medicine must be taught purely as a science. The practice of medicine is not purely scientific, and it never can be.

Many pathies have come and gone. The regular physician has lived through it all absolutely because he has accepted any thing that was

workable and has never confined himself to any system that was not amenable to wide variation. He uses the drugs that produce certain physiological effects. If the dosage in one case produces the proper effect, that is the dose for that patient, but he may change it for another when it does not produce the effect. He knows that as alcohol produces different effects in different individuals so do all other drugs. He does not use mental suggestion as a cure-all, but he uses it, nevertheless. The fact that the quack or the fanatic utilizes some remedy will not deter him if he finds virtue in their methods. Neither will he discard all but the scientific until science is able to cure all things,—and that time will probably never come.

As we have worked to relegate useless remedies to the scrap heap, so we must work to retain and revive methods that have stood the test of time. We, ourselves, are unable to discard many things scientifically unsound. None of us are materialistically enough inclined to lie in pain without a murmur even though we know the ministrations that are at hand are useless. If I were in pain, I would bless the individual who applied useless remedies with good intention, and I would curse the individual who ignored my suffering. Useless treatment properly applied is far better than none at all. In times of necessity, such treatment has deserved and received the commendation of both high and low. And, if credit were never given except where material benefits were bestowed, the healing art would not now stand on its present pinnacle.

Science is exacting. It is interested in diagnosis first, and treatment last. That is perfectly proper when it can be done. But, the unscientific mind does not grasp the idea. Most of our patients are wholly unscientific and are looking only for relief. We, ourselves, want relief while the diagnosis is being made. Our families want some consolation, and when the diagnosis *is* made we do not want to be abandoned by the medical profession because science is unavailing. Much can be done by the profession in hopeless cases if we are trained to handle them. Even in cases where scientific methods are used to the best advantage, much can be done to add to the happiness of the patient and his family by the application of art. So, we learn that the art of medicine comes into play in all cases while science is applicable in only a limited number.

The changes advisable are not so easily determinded. It would be presumptuous for any one individual or even any one class of medical men to presume to know just what the curriculum should be. The degree of M. D. has various meanings at this time. Perhaps there should be more than one degree of medicine. The object in bringing up this subject is not to criticize any class of the profession, but is to present ideas for thought. The teachers of medicine are doing their best to produce the most efficient medical men possible. It is easy to criticize, but much harder to improve the methods.

The independent doctor is rapidly disappearing from the field of medicine. At the rate we are now going, in twenty-five years he will be no more. We realize that the medical field has grown so broad that it is no longer a one man's game. Nevertheless, every family needs its family physician as badly today as it ever did. Some individual must be provided who will visit a family when any member of that family becomes indisposed, and who can intelligently handle the family as well as the patient.

513-A Missouri Ave.

THE RELATION OF ASTHMA TO BRONCHO-PULMONARY INFECTIONS AND INFLAMMATIONS*

SAMUEL M. FEINBERG, M. D.,

Attending Physician, Cook County Hospital; Attending Physician, Washington Park Community Hospital; Associate in Medicine, Northwestern University Medical School

CHICAGO

Although the relation of bronchial asthma to bacterial infection is still an unsettled problem there are many clinical aspects of this relation which are well worth our consideration. In the literature on asthma one finds numerous papers dealing with upper respiratory infection, particularly sinus disease, and its etiologic and therapeutic bearing on bronchial asthma. However, with the exception of a very few papers, among the most important of which is that of Peshkin,[1] very little is said about the association of asthma with infection of the bronchi or

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lungs. It is this latter phase of asthma that I wish to take up in this presentation.

It hardly needs to be mentioned that protein sensitization is responsible for a large proportion of cases of asthma. This is a well established fact, repeatedly shown by many observers and successfully applied in my own experience. However, it must also be admitted that there are numerous instances of asthma in which protein sensitization cannot be demonstrated and also many cases of protein-sensitive asthmatics in whom additional factors are at play in the causation of their asthma. Many of these cases are apparently associated with bacterial infection.

That bronchial asthma and infections of the bronchi and lungs are frequently associated is a common observation evident to every medical man. It is true, however, that the relationship of these two conditions is not the same in every patient: there are several ways in which bronchopulmonary infection and asthma may be associated. The treatment of the individual patient will depend on the manner of this relationship.

It is the purpose of this paper to classify the relationship of bronchial asthma to bronchopulmonary infections and inflammations, to illustrate these classes with suitable examples, and to point out the importance of each class. In this presentation tuberculous infection of the lungs will not be considered, nor will there be any attempt made to discuss the debated question of bacterial allergy and its relation to bacterial infection. Although no statistics are presented at this time, the clinical impressions are based on an experience with about one thousand cases of asthma.

Class I. Non-allergic Asthma Following Bronchopulmonary Inflammations.

A very large percentage of asthmatics give a history of preceding infection or inflammation of the lower respiratory tract. This initial infection may take the form of a chronic bronchitis, or a more acute condition such as acute bronchitis, pneumonia, influenza, or whooping cough. Many of these asthmatics are entirely negative to all skin tests. Before one fully accepts such an explanation for the asthma one must satisfy himself on two points: the absence of protein sensitization and the reliability of the diagnosis of the preceding infection. The asthmatics in this large class divide themselves into two main types which differ considerably in their pathology and treatment.

Subclass A. Those following chronic bronchitis.

Many cases of the non-allergic type are a direct consequence of chronic bronchitis. This occurs more commonly in individuals past middle life. However, it has been recognized that this may occur occasionally also in younger individuals and even in children. In such instances it is important to rule out the possibility of an allergic or sensitization form of bronchitis. Very frequently the bronchitis may not be of a chronic nature but have a tendency to take the form of acute recurring attacks, each individual attack or series of attacks being followed by asthma. The importance of recognizing this group lies in its therapeutic possibilities. It is this group of cases which can be helped considerably by bacterial vaccines.

Subclass B. Those following acute inflammation, especially with residual lung changes.

These cases follow such acute pulmonary processes as pneumonia or influenza. The asthma may come on immediately after the acute infection or there may be an intervening cough for a variable interval. Very frequently it is due to a failure of resolution of the infiltrative process. It is in this type particularly that x-ray therapy has given such brilliant results. Harkavy[2] has especially called atteition to the rôle of unresolved pneumonias in bronchial asthma. In a series of 160 cases of asthma he found nine whose condition was a result of unresolved pneumonia, chiefly of the influenza variety.

The following is one of a number of similar cases which illustrates the history of this type:

Perry F., aged nine was first seen on June 5, 1928, with the complaint of dyspnea, wheezing and cough of a year's duration. These symptoms followed an attack of pneumonia. She has had measles and whooping cough; his tonsils and adenoids were removed four years ago. His aunt has asthma.

Physical examination was negative except for the chest findings typically found during the asthmatic state. All protein skin tests were negative. The urine and blood were essentially normal. X-ray of the chest showed a diffuse pulmonary infiltration.

On August 21, 1928, the boy was given x-ray therapy posteriorly over the chest, and on September 8, anteriorly. About a week following the

second irradiation the asthma and cough disappeared. There has been a slight recurrence of his symptoms in the last few days and it is planned to give him another course of x-ray therapy.

Class II. Allergic Asthma Following Bronchopulmonary Inflammations.

There are many instances of asthma of the allergic, or protein sensitive type, which follow pneumonia, bronchitis and similar infections. Without sufficient investigation the history of these asthmatics usually mislead us into considering them as the bacterial type. It seems that the inflammatory condition of the bronchial tubes favors the localization of the allergic symptoms to that part of the body. It has been pointed out by Vaughan[3] and others that the occurrence of this non-specific factor, such as bronchial inflammation, mechanical irritation of the skin, mechanical obstruction in the nose, in great part will determine whether and where the specific allergic lesion will take place. For instance, an individual may be sensitive to feather dust but may have no clinical symptoms because of his being in a state of "allergic balance." If, however, a sinus infection supervenes, the nasal mucosa may be sufficiently irritated to allow the localization of the sensitization with the production of an allergic rhinitis. Whether this lowered resistance of the bronchi to the allergic substance is due to an increased permeability or to an increased irritability or whether it is due to an entirely different process, is an unsettled matter.

This type of asthma may follow either an acute condition like pneumonia or influenza; it may follow a chronic bronchitis or recurring "cold"; or it may follow a seasonal pollen asthma. The importance of this group lies in the recognition of the allergic factor, as failure to do so will produce unsuccessful results.

Subclass A. Allergic asthma following pneumonia or influenza.

Asthma following pneumonia is usually of the non-allergic type. However, allergic asthma after such illness is found frequently enough to warrant an investigation into the allergic factors in such cases. The following case is a typical example of several others that I have encountered:

Frieda S., aged 17, office clerk, first seen on October 21, 1926. She complained of dyspnea, cough and wheezing, occurring in attacks, recently about once a week. Her complaints are of five years duration. In the spring of 1921 she had influenza, following which the cough persisted and was followed by asthma in July of the same year.

Other essential points in the history are: Measles as a child, questionable scarlet fever, whooping cough at ten years of age, and tonsillectomy at the same age. An older brother has had asthma and a sister has asthma.

Examination showed loud wheezing râles, some emphysema, and a right kyphoscoliosis. The nose and throat were negative.

The sputum showed a predominance of streptococci, staphylococci, and micrococcus catarrhalis; there were no tubercle bacilli. The blood count and urine were normal and the Wasserman test was negative. The x-ray showed an appreciable degree of peribronchial infiltration or fibrosis.

The skin tests showed repeated positive reactions to cat hair. The patient had no cat at home. However, in accordance with my experience in similar cases where the source of animal epiderm sensitization cannot be located, I thought it advisable to try desensitization therapy. Injections of cat hair extract were begun on November 9, 1926. The patient had two light attacks of asthma on December 26 and 31, respectively. The treatment was continued until April 19, 1927. From January 1, 1927, to January 17, 1928, at which time we had the last report from the patient, there has been no recurrence of the asthma.

This, then, is evidently a case of allergic asthma, following an influenza, and successfully treated by allergic methods.

Subclass B. Allergic asthma following bronchitis, especially of the chronic type.

Whenever asthma follows a chronic bronchitis we are apt to make a hasty diagnosis of bacterial asthma. That such is not the case in all asthmatics giving a history of bronchitis can be definitely shown in many instances. The chronic bronchitis may be merely the localizing factor while the superimposed allergy has to be investigated and treated. Now, it is true that many of these cases have never had an infectious bronchitis to begin with, but have existed for considerable time prior to the dyspneic stage as cases of allergic bronchitis. Nevertheless, there are some cases where the allergy is secondary to a definite infectious bronchitis.

Mrs. J., aged 54, housewife, first seen on April 19, 1928, complaining of asthma of three years duration. Her symptoms are more troublesome in winter. She says that she had had bronchitis every winter for seven years. Examination disclosed typical findings of asthma. Because of the age of onset of the asthma and because of the definite history of preceding chronic bronchitis it was thought that sensitization tests would be useless. However, tests were made and much to my surprise resulted in several positive reactions. These were barley, asparagus, beans, wool and feathers. Sub-

sequent developments showed that the feathers were chiefly responsible for her paroxysms.

Subclass C. Perennial asthma following a seasonal pollen asthma.

Many cases of hay fever develop a seasonal asthma as a result of the pollen sensitization. If the pollen sensitiveness is not mitigated there may occur in time a continuance of the asthma outside of the pollen season. I have many records of such histories. The following is typical:

Eli R., aged 50, first seen in October, 1927, complaining of a constant all-year round asthma. He has had autumnal hay fever for 30 years, which later was complicated by seasonal asthma. For the last five years he has had asthma throughout the year. Skin tests showed positive reactions to the ragweeds, cat hair and dog hair. It developed further from his history that he had a cat up to two years ago, at which time he disposed of it. Following that he had no asthma until he got a dog, which he has at present. Shortly after the acquisition of the dog the asthma recurred.

Subsequent repeated clinical trials showed this man to be sensitive to the hair of his dog.

Class III. Bronchopulmonary Infections in the Course of Asthma.

Subclass A. Bronchitis, acute or chronic.

Bronchitis, either acute or chronic, occurs very commonly in the course of asthma; this is apparently the result of the asthma. The abnormal conditions in the blood supply and the stasis of the bronchial secretions predispose to bronchial infection. Perhaps this infectious factor is present in all cases of chronic asthma, but in some cases it is particularly pronounced. Hurwitz[4] has also called attention to the importance of this type. It is essential to recognize this element of infection, as treatment based on the purely allergic findings in such a case may be unsuccessful. The secondary infection very frequently must be treated. Vaccine therapy has been of great help in this group. The following is a typical case history:

Charles N., aged 4, first seen on July 19, 1927. He has had perennial asthma for the last three years and hay fever for the last two years. He also has urticaria and had eczema from the age of four months to two years. His mother has hay fever and his maternal grandmother has asthma.

Examination showed a marked barrel-chest with typical findings of asthma. The boy was well developed and exceptionally well nourished. Skin tests showed many positive reactions, including ragweed and grass pollens, a number of foods, feathers and hairs.

The offending foods were eliminated from the diet, feathers were removed, and pollen injections were given. In spite of the above measures the improvement was only moderate. There continued to be considerable asthma and a great deal of bronchitis. A course of autogenous vaccine practically eliminated all bronchitis and remaining asthma.

Subclass B. Pneumonia in the course of asthma.

Whether or not the individual case of asthma is primarily due to bacterial infection or to protein sensitization pneumonia is a frequent sequel. This is, of course, the most important cause of death from asthma. In many instances there are repeated attacks of pneumonia. It is important to recognize the presence of this tendency, as a great deal may be done to forestall such complications. Some of the measures which may be employed with some degree of success are avoidance of exposure to severe weather conditions, the proper use of bacterial vaccines, and quartz light therapy; and in some cases a change of climate may be advisable.

Class IV. Asthma Erroneously Diagnosed as Bronchopulmonary Infections.

Many cases of asthma, particularly in children, are diagnosed as pneumonia, influenza, bronchitis, or adenotonsillitis. This failure to recognize the true nature of the condition in children is due to the fact that in them the asthmatic syndrome may be entirely different from that in the adult. Kahn[5] has called repeated attention to this dissimilarity. In children fever and prostration are common symptoms of asthma while definite dyspnea may be entirely lacking.

There is another condition, also more prominent in children, to which little attention has been paid in the past. Among others, Waldbott[6] has shown that protein sensitization may affect the bronchial tubes with the production of cough and no other symptoms. This is designated as "allergic bronchitis." Many of the chronic or recurring unexplainable coughs in children will undoubtedly be found to be due to a protein sensitization.

SUMMARY

1. A classification is presented showing the various ways in which bronchial asthma and bronchopulmonary infections may be associated.

2. Bronchopulmonary infections or inflammations are frequently the intial cause of asthma.

3. Asthma followed by such inflammations may be either of the protein-sensitive or the non-sensitive type: the treatment of these types differs materially.

4. Bronchopulmonary infections are frequently the result of chronic asthma.

5. Such complicating infections in the course of asthma must be recognized and treated whether the asthma is allergic or not.

6. Many erroneous diagnoses of respiratory infections are made when the true nature of the condition is a bronchial asthma or an allergic bronchitis.

185 N. Wabash Ave.

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5. Kahn, I. S.: Essential differences in chronic pollen hay fever and asthma in children and in adults, J. Lab. and Clin. Med., 12:1197, 1927.

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DISCUSSION

Dr. R. O. Stites, Industry. He said something about vaccines. I wonder whether he used stock or autogenous? I have utterly no faith in any stock vaccine except typhoid as a prevention.

Dr. S. M. Feinberg, Chicago: As to the matter of vaccines, we have used both stock and autogenous. When we use stock vaccine we use them from other patients who have a similar condition. That is, we get the streptococcus and staphylococcus and pneumococcus from patients who have asthma, and use them in the treatment of similar cases.

A STUDY OF RUPTURED AORTIC ANEURYSMS

JAMES G. CARR, M. D., AND LAURENCE E. HINES, M. D.

From Northwestern University Medical School and Cook County Hospital

CHICAGO

A review of the post-morten and clinical findings of 100 patients who died at Cook County Hospital of cardiovascular syphilis revealed 15 who had ruptured aortic aneurysm. This high percentage (15%) indicates a greater incidence of rupture in syphilitic disease of the aorta than is commonly appreciated. Our study of the 15 cases is made with particular reference to age, sex, symptomatology, clinical diagnosis and site and reference of rupture.

The average age at which rupture occurred was 38. The oldest patient was 61, the youngest 24. Only two of the 15 were women, whereas 28 of the whole group were women. Table I shows the age incidence.

The duration of symptoms which could be attributed to the aneurysm varied from 1 day to 5 years. Some difficulty has been encountered in differentiating the symptoms prior to and subsequent to rupture. As a rule the symptoms following rupture are of shorter duration and more severe than those perceding the rupture, but in some cases when the rupture is gradual and associated with a reparative process, it is not possible to differentiate sharply.

Pain was the most constant symptom. It was present in 14 cases, either before or after rupture of the aneurysm. In nine it was described as severe, lancinating, or stabbing, while in five it was referred to as dull or aching. Dyspnea was present in all but two, both aneurysms of the abdominal aorta. Hemoptysis, next in order of frequency, was present in 6 patients, either as marked hemorrhage at the time of death or as blood streaked sputum from 1 to 14 days before death. The frequency of the symptoms is indicated in Table 3.

The location, degree, and character of the pain varied greatly. In many cases there was no pain until a short time before death. In others, pain had been present for years and was greatly aggravated at the probable time of rupture. Excerpts from the clinical records are given to illustrate variations of pain and other symptoms.

Case 1: J. P., a man, aged 29 years, worked in a foundry up to 9 days before death. While laughing and joking with comrades, he suddenly fell, became stiff and unconscious. When aroused, he complained of severe, sharp pain to the left of the sternum. This was aggravated by cough and deep breathing. Blood streaked sputum was expectorated, fever and signs of consolidation in the left lung developed, the pain persisted, and he died 9 days after the first symptom. A clinical diagnosis of pneumonia was made, but the necropsy revealed an aneurysm of the arch which had perforated and eroded into the left lung and pulmonary artery. In all probability, the first symptom presented by this man was due to the rupture of the aneurysm.

According to our statistics and those of others (Leman[1]) aneurysm ruptures into the pericar-

1. Leman, I. F., Aneurysm of the Thoracic Aorta, Amer. Journ. of Med. Sc. 152, p. 210, 1916.

dial sac more frequently than into any other viscus. The symptoms of rupture into the pericardium are illustrated by the following case report:

Case 2: J. C., a man, aged 58 years, known to have had syphilis for 24 years, had no symptoms referable to the heart or vascular system until the day before death, when suddenly a terrifying pain developed over the clavicles and spread down to the epigastrium. A squeezing, oppressive sensation behind the sternum was associated with the pain. After 10 minutes, the severe pain subsided to a dull epigastric ache and nausea. Eighteen hours later, severe substernal pain recurred and persisted 1½ hours until death. Such symptoms as these are similar to those of severe coronary disease. Findings which should differentiate the two conditions are physical signs of a pericardial effusion, particularly the striking weakness of the heart tones.

Another case which illustrates an anginal type of pain is:

Case 3: J. W., aged 50 years, had paroxysms of severe, substernal, oppressive-like pain which usually radiated to the left shoulder and down the left arm. After 6 months there was a sudden, dramatic death with blood gushing from his mouth. The necropsy revealed an aneurysm of the descending aorta which had ruptured into the left main bronchus.

Precordial pain is often present in the terminal stages of decompensated heart disease. Generally, the pain is mild unless due to coronary thrombosis. In the following case report of decompensated heart disease, the terminal precordial pain was due to a dissecting aneurysm of the aorta.

Case 4: O. S., a married woman, 24 years old, had recurring symptoms of decompensated syphilitic cardiac and renal disease (hypertension, edema and dyspnea). There was no pain until the day of death, when she complained bitterly of precordial pain and marked dyspnea. The necropsy revealed a dissecting aneurysm of the thoracic aorta which had ruptured into the mediastinal fatty tissues.

Case 5: This illustrates the type of pain caused by aneurysm which erodes the sternum and vertebrae. R. B., a woman, 27 years old, complained of constant, boring pain in the region of the upper sternum for several months. A swelling in the region of the manubrium sterni gradually developed. Death followed a severe hemorrhage through the skin, described as a spurting of blood from the neck.

Hemoptysis, which occurred 6 times, is emphasized for its infrequency. The greater number of ruptured aneurysms show no external evidences of bleeding. More general appreciation of this fact will lead to more frequent clinical recognition.

The dyspnea presented by the patients in this group is of two types: breathlessness on exertion, associated with other symptoms of a failing heart, present for a long period of time before death; the severe dyspnea which probably develops at the time of rupture and continues until death. In one case, this was described as, "breathing was rapid and labored." In another case, "he gasped several times and died."

As shown in Table 3 only two patients had edema. The infrequency of symptoms of decompensation in patients who die with ruptured aneurysms might be explained on the basis of restricted activity which decompensated patients undergo. Thus the rise of intra-aortic pressure that is necessary to cause rupture is prevented.

A clinical diagnosis of aneurysm had been made in 7 cases, and the presence of rupture had been diagnosed in only three.

The mistaken diagnoses were: Lobar pneumonia; pyonephrosis of right kidney; uremic coma with nephritis; bowel tumor; hypertension with aortic regurgitation; cerebral thrombosis with broncho-pneumonia; neoplasm of lung; and angina pectoris.

Table 4 shows the site of perforation and the part into which bleeding occurred. The ascending aorta ruptured in 8: five times into the pericardial sac, and three times through the sternum. In two instances, the aneurysm ruptured externally through the skin.

Summary: Autopsies of 100 cases of cardiovascular syphilis revealed ruptured aneurysm as the cause of death in 15%.

The greatest incidence of rupture occurred in the decades 30 to 40 and 20 to 30.

Pain and dyspnea were the outstanding symptoms prior to and after the rupture; external bleeding was present eight times.

Mistaken clinical diagnoses were frequent.

Rupture of the ascending aorta into the pericardium is the most common form.

Society Proceedings

ADAMS COUNTY

The regular monthly meeting of the Adams County Medical Society was held in the W. C. U. Building, Nov. 11, 1929. The meeting was called to order by the President, at 8:20 P. M., with 34 members and three visitors in attendance.

Dr. A. H. Bitter gave an interesting report of the 1929 meeting of the American College of Surgeons, held in Chicago, and Dr. Miller gave an equally interesting report of the 1929 meeting of the Interstate

Post graduate Medical Association of North America, held in Detroit.

This was followed by a scientific program conducted by the Peoria City Medical Society. Dr. Wilbur L. Bowen of Peoria, read a paper entitled, "Surgery of the Thyroid," which was discussed by Drs. Koch, Ross and Stevenson, and finally closed by Dr. Bowen. Dr. Perry B. Goodwin of Peoria, gave an interesting paper on "Diverticula of the Esophagus," illustrated with lantern slides. This paper was discussed by Drs. Stevenson, Shulian, Miller and Swanberg, and finally closed by Dr. Goodwin.

The Secretary made a motion that the Society extend a rising vote of thanks to the essayists for coming to Quincy to address us. This was unanimously carried.

Dr. C. D. Center, chairman of the committee that has been appointed to draft a new Fee Bill, read the report of the committee. This report consisted of a new Fee Bill which was ordered printed and sent to all of the members by mail in order that they may have an opportunity to thoroughly consider it by the time of the December meeting.

Drs. C. O. Molz, H. H. Fletcher, and I. H. Wineberg were elected to membership in the Society.

The meeting adjourned about 10:45 P. M.

HAROLD SWANBERG, M. D.,
Secretary,

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting, Nov. 13, 1929

The Prevention of Contagious Diseases—Archibald L. Hoyne, Superintendent, Municipal Hospital for Contagious Diseases, City of Chicago.

Comment: Arnold H. Kegel, Commissioner of Health of the City of Chicago.

Regular Meeting, November 20, 1929

The Clinical Physiology of Aortic Insufficiency—Carl J. Wiggers, School of Medicine, Western Reserve University, Cleveland Ohio.

Discussion: James G. Carr, Professor A. J. Carlson, University of Chicago.

Joint Meeting of the Illinois Division of the Society for Experimental Biology and Medicine and the Chicago Medical Society, Nov. 27, 1929

1. The Clinical Use of Ephedrin Sulphate in the Treatment of Acute Shock from Trauma or Hemorrhage, Carl A. Johnson.
2. Acute Dilatation of the Stomach, L. R. Dragstedt and James C. Ellis.
3. Effect of Therapeutic Venous Ligation on Blood Flow in Cases of Arterial Occlusion, M. L. Montgomery, (Introduced by Dr. Dragstedt).
4. Embryo-Arsenic Tumors in Rats, F. A. McJunkin and M. F. Cikrit.
5. Clinical Significance of Indicanaemia, P. Shapiro and B. L. Monias, (Introduced by Dr. R. H. Jaffe).
6. Experimental Jejunal Ulcer, G. B. Fauley and A. C. Ivy.
7. On the Non-Existence of a Hormone for Salivary Secretion, J. Sacks and M. S. Kim, (Introduced by Dr. A. C. Ivy).
8. Attempts to Visualize the Gallbladder of the Rabbit with tetraiodophenolphthalein, H. C. Lueth and A. C. Ivy.
9. The Non-Ubiquitous Occurrence of Secretin, Glenn E. Drewyer and A. C. Ivy.
10. Intravenous Administration of Irradiated Ergosterol, C. I. Reed.
11. The Action of Specific Diuretics, George Curtis.

By Title

12. Reoccurrence of Cardio-Accelerator Fibers in the Vagus Nerve of Dogs, C. I. Reed.
13. The Effect of Certain Alkaloids on Early Cleavage in Arbacia Punctulata, M. A. Hinrichs and I. T. Genther.
14. Modification of Development in Arbacia Punctulata on the Basis of Differential Susceptibility to Certain Alkaloids, M. A. Hinrichs.

HENDERSON COUNTY

The semi-annual meeting of the Henderson County Medical Society was held at Biggsville, Illinois, November 6, 1929, with about forty-five physicians of western Illinois and eastern Iowa present.

The first speaker on the program was Dr. John J. McShane of Springfield, chief of the Department of Epidemiology of the State Department of Health. Dr. McShane talked on "Principles of Epidemiology," which was a very practical talk and was greatly appreciated by all present. A general discussion of contagious diseases, the functions and efforts of the State Health Department in their control, methods of conveyance and some of the more recent developments in the etiology and management of these cases. An excellent resume of the work on Undulant Fever was also given by Dr. McShane and a history of the disease to the present time.

Dr. R. C. McMillan, for twenty years city Health Commissioner of Monmouth, led the discussion of this talk. Dr. McMillan told of the changes in contagious disease control that have occurred in the past twenty years and gave an interesting discussion of the paper. The talk of Dr. McShane was also discussed by a number of others and many questions were asked relative to various requirements of the State Health Department and their work in controlling disease.

Doctor Joseph Greengard, associate in Pediatrics, University of Illinois College of Medicine, Chicago gave a paper on "Prophylaxis in Infantile Diseases." This was a very practical and interesting talk on the prevention of diseases of infants, the essentials of infant feeding, the early addition of other foods in addition to milk, in many cases, pre-natal rickets and the prophylaxis of nutritional diseases in general.

Dr. Ralph Graham of Monmouth in discussion told of the necessity of proper pre-natal care, in prevention of many nutritional diseases of infants, told of his preference for boiled milk in infant feeding to questionable pasteurized milk, the dangers of feeding frozen milk

to infants and gave an excellent discussion of the paper.

Dr. Louis N. Tate of Galesburg also discussed the paper from the standpoint of one chiefly interested in the care of children. Several others present also discussed the paper.

After the Scientific Meeting was concluded the five members of the Henderson County Society acted as hosts to an excellent dinner, concluding the program.

Physicians were present from Burlington and Fort Madison, Iowa, Monmouth, Galesburg, Canton, Cuba, Prairie City, Avon, Little York, Stronghurst, Oquawka, Gladstone and Biggsville.

During the meeting the only practicing physician in Henderson County who was not a member joined the Society making Henderson County another 100% society, from the standpoint of membership. All physicians in attendance voted the Henderson County men excellent hosts and assured them that at the next meeting of the society, they would be present and bring others with them assuring them of twice the attendance that were present at this meeting.

ISAAC F. HARTER, Secretary.

Marriages

THOMAS ADDISON BAIRD, Rockford, Ill., to Miss Edna Allred Records of San Antonio, Tex., in September.

MAURICE A. BERNSTEIN to Miss Edith Mason, both of Chicago, at Antioch, Ill., October 6.

JOHN CHARLES BERRY to Mrs. Ida W. West, both of Chicago, October 5.

WILLIAM STEWARD BEYER, Rockford, Ill., to Miss Mary Ella Ferguson, at Madison, Wis., October 23.

F. WILLARD BROWN, DWIGHT, Ill., to Miss Agnes Michaelson of Kankakee, October 31.

WARD A. DE YOUNG, Chicago, to Miss Abigail Robinson at Saugatuck, Mich., October 26.

WILLIAM T. FERRIS to Miss Thelma Mae Swales, both of Chicago, October 10.

JULIUS P. KISSEL to Miss Mary Nolden, both of Centralia, Ill., at St. Louis, October 16.

THOMAS F. KRAUSS to Mrs. Ethel Wilcox Hardy, both of Rockford, Ill., October 26.

LAWRENCE E. PIERSON, Chicago, to Miss Alma Gladys Hill at Stanhope, Iowa, October 22.

THOMAS E. ROBERTS, Oak Park, Ill., to Miss Mabel M. Osgood, October 26.

ISAAC C. WALKER to Miss Lois Metsinger, both of Marion, Ill., in Chicago, August 14.

NELSON A. WRIGHT, JR., Pekin, Ill., to Miss Melba R. Blank of Peoria, at Springfield, October 5.

Personals

Dr. Oscar D. Mulliken has been elected president of the Elgin Physicians' Club for the ensuing year.

Dr. Solomon Strouse, associate clinical professor of medicine, Rush Medical College, addressed the Cincinnati College of Medicine, November 14, on "Obesity."

Dr. Clement L. Martin, Chicago, addressed the Bureau County Medical Society, November 14, on "Treatment of Hemorrhoids by Nonsurgical and Operative Methods."

Dr. Charles Mayo, Rochester, Minn., addressed the Winnebago County Medical Society, Rockford, November 5; Dr. Plinn F. Morse, Detroit, spoke on diseases of the gallbladder.

Dr. Argal E. Hubbard, for about ten years medical director of the Municipal Tuberculosis Sanatorium at Peoria, resigned, November 15, to engage in private practice.

Dr. Arnold H. Kegel, Health Commissioner of Chicago, was the guest of the council of the Chicago Medical Society at its November 12 meeting, at wich he stated that he desired the council to know that he welcomes suggestions for the betterment of the public health of the community.

Dr. Italo F. Volini, professor and head of the department of medicine of Loyola University School of Medicine, has been awarded the rank of chevalier of the Crown of Italy for "service to the Italian people in the United States and for fostering Italian ideals and culture."

Dr. Charles A. Elliott, professor of medicine, Northwestern University Medical School and recently Vice President of the American Medical Association, has been appointed a member of the medical council of the U. S. Veterans' Bureau to succeed the late Dr. Frank B. Granger of Boston.

Dr. William C. Woodward, director, Bureau of Legal Medicine and Legislation, American Medical Association, addressed the South Chicago Branch of the Chicago Medical Society,

October 29, on "What the Physician Should Know About Malpractice," and Dr. Anton J. Carlson, professor of physiology, University of Chicago, "Relation of the Sympathetic Nervous System to Metabolism."

Dr. Charles B. Reed, president of the Chicago Medical Society, on December 22 will give the last of a series of lectures which are being given by the Chicago Academy of Science in Lincoln Park on Sunday afternoons at 3 p. m. Dr. Reed's subject will be "Is the Doctor Responsible for the High Cost of Illness?"

Dr. G. Carl Huber of the University of Michigan Medical School, Ann Arbor, delivered the first Stephen Walter Ranson Lecture at Northwestern University Medical School, November 14, on "The Regeneration of Peripheral Nerves."

Dr. Wendell C. Phillips, New York, Past President of the American Medical Association, addressed the Chicago Laryngological and Otological Society, November 4, on "Application of Medical and Social Science to the Problems of Acquired Deafness."

The board of trustees of Northwestern University, by unanimous action, has combined the departments of obstetrics and gynecology, and has appointed Dr. Arthur H. Curtis as chairman and professor. Dr. Curtis graduated at Rush Medical College in 1905, was a Cook County Hospital intern, and did graduate work in Vienna and Berlin. He is a past president and secretary of the American Gynecological Society, and has recently published a book on gynecologic diagnosis. Dr. Curtis has practiced in Chicago since 1909 and has held the professorship of gynecology since the death of Dr. Thomas Watkins.

Dr. Rollin T. Woodyatt is reported to have been bequeathed about $276,000 by the will of the late William Liston Brown, formerly of Chicago, who died, November 1, at Pasadena, Calif., aged 87. The will also provides that a portion of his $2,000,000 estate, amounting, as estimated by an expert, to $645,000, be given to the Presbyterian Hospital; $275,000 to the Chicago Memorial Hospital; $185,000 to the Evanston Hospital, and $92,000 each to the County Home for Convalescent Children and the Home for Destitute Crippled Children.

Dr. Henry E. Wagner has returned from Europe and may be found at 25 East Washington street, Chicago.

News Notes

—The cornerstone of the New Bethany Hospital, Trumbull Avenue and Van Buren Street, was laid Sunday, November 3.

—An epidemic of seventy cases of Vincent's angina, or so-called trench mouth, was reported at the Spaulding School for Crippled Children, October 30.

—The Chicago Orthopedic Club was addressed November 8, at the Medical and Dental Arts Club by Drs. Beveridge H. Moore on "Bone Lengthening Operation" and Fred W. Hark on "Bifurcation Operations."

—The Chicago Tuberculosis Society was addressed, November 14, by Dr. Philip H. Kreuscher on differential diagnosis, pathology and treatment of surgical tuberculosis, and by Dr. Theodore Cornbleet on "Medical Aspects of Cutaneous Tuberculosis."

—The Chicago Council of Medical Women will be addressed, December 6, at the Medical and Dental Arts Club by Drs. Irene T. Mead and Lena Sadler on colitis, and treatment of hemorrhoids, respectively.

—The Perry County Medical Society, Pinckneyville, held a symposium on pneumonia, October 29, the speakers being Drs. Leslie D. Cassidy, Oliver Abel, Jr., Carliss M. Stroud, John W. Thompson, Jr., and Frank R. Finnigan, all of St. Louis.

—The Chicago and Milwaukee roentgen-ray societies met jointly at the Virginia Hotel, November 14; Drs. Eben J. Carey, Milwaukee, spoke on "Physiology and Pathology of Bone Growth"; Fred J. Hodges, Madison, on "The Teaching Value of a Roentgen Film," and Frank W. MacKoy, Milwaukee, on "Gastro-Intestinal Diverticula and Associated Diseases."

—The Chicago Gynecological Society was addressed, November 15, by Dr. Géza de Takáts on "Treatment of Varicose Veins and Thrombophlebitis," and by Drs. Jacob Meyer, Julius E. Lackner and Sydney S. Schochet on "Paroxys-

mal Tachycardia in Pregnancy: Review of the Literature, with a Report of Two Cases."

—The Aesculapian Society of the Wabash Valley held its eighty-third annual meeting at Paris, October 31; Dr. Charles S. Laughlin, Vineland, N. J., spoke on "Our Idiosyncrasies of Conduct, the Basis and Continuing Cause of Unethical Practice"; Dr. Walter N. Thompson, Sullivan, Ind., on "The Physicians' Duty to the Community," and Dr. Charles H. Voorheis, Hutsonville, Ill., on "The Kidney of Pregnancy."

—The psychopathic laboratory, which for many years has been under the municipal court, has been placed under the direction of the Chicago Department of Health. The health commissioner expects to extend the services of the laboratory to the school child, whereas heretofore they have been confined to court cases. Dr. Meyer Solomon, who has been appointed director of the bureau of mental hygiene, will have general charge of the laboratory, and Dr. David B. Rotman, immediate charge.

—The state architect announced that contracts had been let for the construction of twenty-five fireproof buildings to supplement the state hospitals for the insane at Elgin, Lincoln and Dunning, which urgently need additional room. Ten of the new buildings will be at Elgin, ten at Lincoln, and five at Dunning. The architect, in designing the buildings, planned them to be a standard, so that the construction of similar buildings in the future would be as economical as possible for the state. The buildings will be E shaped with dining and recreation halls at the ends and sleeping quarters in between.

—The state health commissioner stated, November 13, that diphtheria was being reported in Illinois at the rate of about 200 cases a week and that the prevalence has more than doubled in the last two months. Illinois now has, he said, more diphtheria than any large state in the union. The number of cases reported now is 25 per cent above that for the corresponding period of 1928 and higher than for the previous year since 1923. Reports are coming from widely separated points in Illinois, indicating that exposure has been extensive and that the development of cases at almost any place may be regarded without surprise. In view of the late arrival of fall, the commissioner believes that the prospects favor a greater increase.

—The tenth annual report to the governors of the Chicago Institute of Medicine on necropsies in hospitals included reports from fifty-two hospitals of Chicago. There was an increase in the number of autopsies, as previous reports showed. Permission necropsies made in Chicago in 1928 numbered 2,917, as against 2,094 in 1927 and 1,849 in 1926. The percentage of permission necropsies for 1928 for the hospitals reporting was 24.1. This is an important index, the committee says, of the general character of the professional work of the hospital; in a few of them standards of work continued at a low ebb. There were 2,271 cases of death referred to the coroner's office during 1928. The committee thanks the superintendents and staffs of the hospitals reporting for their cooperation.

—The Southern Illinois Medical Association, which held its fifty-fifth annual meeting at Benton, November 7-8, was addressed by Drs. Frederick O. Frederickson, Chicago, president of the Illinois State Medical Society, on "Control of Medical Practice"; Bennett Y. Alvis, St. Louis, on "Tuberculosis of the Eye"; Floyd Stewart, St. Louis, on "Pyelograms and Their Importance to the General Surgeon," and Marion L. Klinefelter, St. Louis, on "Early Diagnosis of Orthopedic Conditions." Dr. Lionel S. Luton, St. Louis, presented motion pictures illustrating the valves of the heart in action. Among other sueakers were Dr. Robert F. Lischer, Mascoutah, who as vice president has been acting as president of the association on account of the poor health of Dr. Albert R. Carter of Murphysboro; Dr. James S. Templeton, Pinckneyville, councilor of the district, who spoke on obstetrics, and Dr. Andy Hall, state health commissioner, on "Maternal and Infant Mortality."

—At a recent meeting of the board of trustees of the University of Chicago, Dr. Joseph B. De Lee was appointed professor of obstetrics and gynecology and chairman of the department for three years from October 1. Dr. De Lee for many years has occupied a similar position at Northwestern University Medical School. The

Chicago Lying-In Hospital, of which he has been the medical director since its foundation, is now affiliated with the University of Chicago and a new building is being erected on the campus on the south side. Other appointments in this department at the University of Chicago include Dr. Fred L. Adair, Minneapolis, as professor of obstetrics and gynecology, and Dr. Eloise Parsons as assistant professor of gynecology. Dr. Howard J. Holloway has been appointed a clinical associate in obstetrics and gynecology at Rush Medical College. Dr. Rudolph W. Holmes has resigned as professor emeritus in the department of obstetrics and gynecology of Rush Medical College.

Deaths

MILTON EBEN BLANCHARD, Marseilles, Ill.; Eclectic Medical College, Cincinnati, 1878; Rush Medical College, 1894; local surgeon for the C. R-I and P. Ry. Company and health officer of Marseilles; aged 77; died, November 1, of cerebral hemorrhage.

CHARLES EDGAR CESSNA, Oak Park, Ill.; Rush Medical College, Chicago, 1885; aged 66; died, September 6, at the West Suburban Hospital, of heart disease.

CORNELIUS L. CLANCY, Chicago; Rush Medical College, 1883; physician and druggist for many years; retired in 1921 after leasing his store for 99 years; aged 76; died, November 19, of chronic nephritis.

FLOYD MERRELLE DONDANVILLE, Dwight, Ill.; General Medical College, Chicago, 1911; aged 46; died, October 17, of hypostatic pneumonia.

PERCY WALKER GILL, Chicago; Illinois Medical College, Chicago, 1908; aged 48; died, October 21, at the Presbyterian Hospital, of chronic nephritis, uremia and bronchopneumonia.

IRVIN J. HECKMAN, Kingston, Ill.; University of Illinois College of Medicine, 1895; former practitioner in Rockford and for several years on medical staff of Elgin State Hospital; aged 68; died, October 28, in Hinsdale sanitarium, following a long sickness.

KATHERINE DEMPSEY HYDE, Chicago; Harvey Medical College, Chicago, 1902; formerly on the staff of the Woman's and Children's Hospital; aged 62; died, October 15, at the Henrotin Hospital, of bronchial asthma.

FRANK WILLIAM KLOCKE, Chicago; Washington University School of Medicine, St. Louis, 1908; member of the Illinois State Medical Society; aged 60; died, October 2, of streptococcus septicemia due to an infected tooth.

MELVILLE C. K. LITTLE, Northfield, Ill.; College of Medicine and Surgery, Chicago, 1905; founder and president of the North Shore Military academy, at Niles Center; aged 46; died, November 3, at St. Clair hotel, Chicago, of chronic nephritis.

MARY VAN ALSTINE MAXSON, Oak Park, Ill.; Hering Medical College, Chicago, 1898; a trustee of Francis Willard hospital for many years; aged 65; died, November 25, of cerebral hemorrhage.

JESSE A. ORR, Metropolis, Ill.; Eclectic Medical Institute, Cincinnati, 1878; Civil War veteran; aged 84; died, October 29, of hypostatic pneumonia.

ORA LEVANT PELTON, JR., Elgin, Ill.; Northwestern University Medical School, 1909; one of the founders of Pelton Clinic; aged 42; died, October 28, of splenomyelogenous leukemia.

JACOB W. ROOT, Kilbourne, Ill. (licensed, Illinois, 1878); member of the Illinois State Medical Society; Civil War veteran; aged 83; died, September 15, of heart disease.

WILLIAM H. ROSS, Jerseyville, Ill.; University of Louisville (Ky.) School of Medicine, 1868; aged 97; died, October 12, of pneumonia.

JAMES ARTHUR ROWLEY, Chicago; University of Michigan Medical School, Ann Arbor, 1926; aged 26; died, November 3, at Wausau, Wis., of endocarditis and renal infarction.

PETER G. RULIEN, Joliet, Ill.; Chicago Medical College, 1890; past president of the Will County Medical Society; formerly city health officer; aged 68; died, August 30, of uremia, chronic nephritis and diabetes mellitus.

WILLIAM SAMMIS, Chicago; Kentucky School of Medicine, Louisville, 1875; aged 76; died suddenly, October 9, in his office.

HORACE HORMELL SHEETS, Oregon, Ill.; Rush Medical College, Chicago, 1902; served during the World War; aged 51; died, October 25, in a hospital at Dixon, of cerebral hemorrhage.

JAMES L. TAYLOR, Springfield, Ill.; Rush Medical College, Chicago, 1877; member of the Illinois State Medical Society; aged 76; died, October 17, of chronic myocarditis.

WILLIAM SEYMOUR WHITE, Evanston, Ill.; Chicago Homeopathic Medical Collage, 1888; formerly president of Evanston branch, Chicago Medical Society; and surgeon in Illinois Militia; aged 64; died November 16, at North Shore Health resort, of cardio-vascular-renal disease.

SAMUEL S. WINNER, Chicago; Chicago College of Medicine and Surgery, 1909; for fifteen years connected with the state department of public health in Illinois; aged 44; died, September 22, of cerebral hemorrhage.

FRED WILLIAM ZANDERS, Troy, Ill.; St. Louis Medical College, 1875 Civil War veteran; aged 83; died, October 11, of senility.

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